

A DISEQUILIBRIUM MODEL FOR INTER-
NATIONAL CAPITAL FLOWS

Heinz Glück
Stefan Schleicher

Research Memorandum No. 130

April 1978

Abstract

This study analyses international capital movements for sixteen industrial countries. The basic aim is to check the feasibility of an econometric approach to a subject with lots of institutional detail and rapid structural change. Therefore, special attention is given to the statistical parameter estimation problem. Instead of ad hoc specifications which might pretend a better fit in the sample period but do not necessarily improve the forecasting properties, all estimated equations strictly follow the theoretical model derived from the theory of international capital movements.

Starting with the two major developments presented recently in the theory of international capital flows, namely the portfolio model and the monetary approach to the balance of payments, we analyze the 'reduced form synthesis' of both concepts. As a complement we propose a disequilibrium model which emphasizes a structural specification and thus overcomes some problems inherent in the reduced form model. In addition, the disequilibrium model enables empirical tests of the relative importance of monetary and portfolio allocation motives as causes for international capital flows.

In all sixteen countries considered the estimation results stress the importance of both monetary and asset allocation aspects. For each country significant influences of current account balance, asset behavior of monetary authorities, national income, interest rates, and exchange rates on capital flows could be traced.

In addition, for most countries wealth effects and explicit speculative factors enter the model. The complete system is highly interdependent via interest rates, exchange rates, and wealth effects.

Despite the fact of large disturbances by singular speculative or institutional events the empirical analysis reveals strong evidence of systematic influences as causes for international capital flows. This result was obtained by using a robust estimation technique that fades out singular disturbances in the sample period.

Zusammenfassung

In dieser Studie werden die internationalen Kapitalbewegungen von 16 Industrieländern analysiert. Hauptanliegen ist es, die Möglichkeit eines ökonometrischen Zugangs zu einem Problem zu prüfen, das wie das vorliegende stark von institutionellen Gegebenheiten der einzelnen Länder geprägt ist und raschem Strukturwandel unterliegt. Besondere Aufmerksamkeit wird daher der Parameterschätzung gewidmet. Anstelle von ad-hoc-Spezifikationen, die eine bessere Anpassung innerhalb der Schätzperiode vortäuschen, aber nicht unbedingt die Prognoseeigenschaften verbessern, folgen alle geschätzten Verhaltengleichungen streng dem theoretischen Modell, das aus der Theorie internationaler Kapitalbewegungen abgeleitet wird.

Ausgehend von zwei bedeutenden neueren Entwicklungen in der Theorie der internationalen Kapitalbewegungen, nämlich dem Portefeuille-Modell und monetären Ansatz zur Zahlungsbilanztheorie wird die 'reduced form synthesis' dieser beiden Konzepte analysiert. Als Ergänzung wird ein Ungleichgewichtsmodell vorgeschlagen, das strukturelle Aspekte betont und damit einige dem reduzierten-Form-Modell inhärente Probleme überwindet. Darüber hinaus ermöglicht das Ungleichgewichtsmodell empirische Tests des relativen Gewichts von monetären und Veranlagungsmotiven als Ursachen für internationale Kapitalbewegungen.

Für alle 16 untersuchten Länder zeigen die Schätzergebnisse die Bedeutung sowohl von monetären wie von Vermögensallokationsaspekten. Für jedes Land konnte signifikanter Einfluß der Leistungsbilanz, der Geldpolitik, des Volkseinkommens, von Zinssätzen und Wechselkursen auf die Kapitalbewegungen festgestellt werden.

Zusätzlich konnten für die meisten Länder Vermögenseffekte und explizit spekulative Faktoren erfaßt werden. Das gesamte System ist in hohem Ausmaß über Zinssätze, Wechselkurse und Vermögenseffekte interdependent.

Trotz starker Störungen durch einzelne spekulative oder institutionelle Ereignisse kann die empirische Analyse eindeutige Evidenz für systematische Einflüsse als Ursachen internationaler Kapitalströme nachweisen. Dieses Resultat wurde erzielt durch Verwendung einer robusten Schätztechnik, die vereinzelte Störungen innerhalb der Schätzperiode eliminiert.

Contents

	Page
1. Introduction	1
2. Theoretical Concepts	2
2.1 The Monetary Sector of an Open Economy	2
2.2 Portfolio Balance Model	5
2.3 Monetary Approach to Balance of Payments Theory	7
2.4 The Reduced Form Synthesis	9
2.5 A Structural Form Synthesis by a Disequilibrium Model	10
3. Econometric Analysis	15
3.1 Estimating Equations of the Structural Form Synthesis Model	15
3.2 Sources and Definitions of Variables	16
3.3 Estimation Method	19
4. Empirical Results	20
5. Conclusions	23
Footnotes	25
References	27
Appendix A: Equations	31
Appendix B: Data Description	65
Appendix C: Data	81

A DISEQUILIBRIUM MODEL FOR INTERNATIONAL CAPITAL FLOWS

1. INTRODUCTION

The increasing imbalance of international capital movements over the recent years has extended the scope of balance of payments analysis from the current account to the capital account. The importance of international monetary linkages has been given increasing attention since they limit the ability of national monetary authorities to pursue an independent monetary policy and may transmit economic fluctuations.

An econometric analysis of international capital flows is motivated at least on the following three grounds. First, it seems to be desirable to investigate to what extent international capital movements are determined by systematic components. Second, we want to find evidence of the validity of the theoretical framework available to explain the causes of international capital flows. Third, international capital flows play a crucial role in the determination of a country's exchange rate and monetary base.

This study analyzes international capital movements for sixteen major industrial countries. The basic aim is to check the feasibility of an

econometric approach to a subject with lots of institutional detail and rapid structural change. Therefore, special attention is given to the statistical parameter estimation problem. Instead of ad hoc specifications, which might pretend a better fit in the sample period but do not necessarily improve the forecasting properties, all estimated equations strictly follow the theoretical models derived from the theory of international capital movements.

We review in Section 2 the theoretical concepts in the theory of international capital flows that have emerged over the last ten years. Starting from what we call the "reduced form synthesis" of the portfolio model and the monetary approach as developed by Argy and Kouri (1974) and Kouri and Porter (1974) a new synthesis of the two basic theoretical concepts in the theory of international capital flows is presented. The structural interpretation of the proposed disequilibrium model overcomes a number of problems inherent in the reduced form analysis. In Section 3 we derive econometric specifications for this model and discuss the data sources and the robust regression technique used for parameter estimation. Empirical results for the sixteen major industrial countries are presented in Section 4.

2. THEORETICAL CONCEPTS

2.1 THE MONETARY SECTOR OF AN OPEN ECONOMY

The ultimate aim of this research effort is the endogenization of the national monetary base in a worldwide model of economic activity. The concept of

the monetary base originally was developed in the framework of a closed economy where the money supply process is under complete control of the monetary authorities. In an open economy, however, the monetary base (M) is composed of a foreign component (F), consisting of international reserves, and a domestic component (D):

$$(1) \quad M = F + D.$$

The first point of interest is the behavior of the monetary authorities in the control of the domestic component of the monetary base. Argy and Kouri (1974) and Herring and Marston (1977) proposed specifications for the policy reaction functions of monetary authorities. Hickman and Schleicher (1977) extended these concepts and tested them for sixteen industrial countries. The basic form of such reaction functions states that changes in domestic assets of the monetary authorities are motivated by external and internal policy targets:

$$(2) \quad \Delta D = a \Delta F + b Z.$$

The external target is represented by changes in foreign reserves (F). Internal policy targets (Z) may be the expansion of the monetary base to a desired level or the financing of government deficits /1/.

The second point of interest involves the causal interpretation of the foreign component of the monetary base. Given the interdependence of all national economies via their foreign reserve holdings any change in the i -th country's domestic assets (D_i) will cause foreign reserve changes in all other countries:

$$(3) \quad \Delta F_i = \Delta F_i(\Delta D_1, \dots, \Delta D_n), \quad i = 1, \dots, n.$$

De Grauwe (1975) uses this feedback relationship as a starting point for an analysis of the interaction of monetary policies and attempts also to estimate parameters of a linearized form of (3). However, he notices severe estimation problems. This is not surprising because equation (3) is essentially a reduced form relationship and therefore suffers from a number of disadvantages in parameter estimation, notably that the more countries are included in the analysis the more parameters have to be estimated. Nevertheless, this first modelling approach is useful in two respects: First, we realize the importance of parameter α in equation (2) for the stability of the system. This equation can be considered as the control law applied by the national monetary authorities. Second, we recognize the statistical estimation problem because of the simultaneity of equations (2) and (3) via identity (1).

Since this simple reduced form approach to the determination of changes in foreign assets failed in the estimation experiments we turn our attention to specifications that include more structural information. The first structural element used is the distinction between current account balance (BC) and capital account balance (BF) as causes for changes in foreign reserves:

$$(4) \quad \Delta F = BC + BF .$$

Once the current account components for merchandise trade, services, and transfers are determined the problem arises to isolate the causes of international capital movements.

2.2 PORTFOLIO BALANCE MODEL

The basic approach in studies of international capital movements is the portfolio balance model to explain the allocation of wealth between domestic and foreign assets. This type of capital flow models was specified and tested by Branson (1968, 1970, 1971) who analyzed international capital flows in a theoretical framework that has been characterized as the "new view of international capital movements".

In contrast to earlier theories of international capital movements which related capital flows to levels of interest rate differentials, in the late 1960's attempts were made to develop a theory of international capital flows analogous to the neoclassical model of capital accumulation, e.g. Jorgenson (1963), and the model of portfolio distribution as developed by Markowitz (1959) and Tobin (1958, 1965). This proposition relates capital stocks to the levels of interest rates and consequently emphasizes that changes in interest rates cause redistributions of portfolios or flows of capital until a new portfolio equilibrium is reached.

Applied to international financial capital movements this theory implies that a change of interest rates will cause a shift in the stock of assets within the portfolio - a "stock-shift effect" - and with growth in total wealth a reallocation of additions to wealth - a continuing "flow effect". With investors reacting to changes in interest rates, the stock-shift effect is expected to be temporary, while the flow effect, assuming steady growth in total assets, will be continuing although small in size compared to the stock-shift effect. A policy implication of this point of view is that in order to finance persistent

trade deficits by foreign capital inflows the domestic interest rate must be rising continuously given a fixed foreign interest rate.

According to this theory the proportion of total wealth (W) allocated to foreign assets (W^f) depends on the expected return on foreign assets (r^f) /2/, the expected return on competing domestic assets (r), and on a risk factor (R):

$$(5) \quad W^f/W = f(r, r^f, R) .$$

Omitting the risk factor and taking differences on both sides of (5) we obtain the following equation for gross capital flows (BF^g):

$$(6) \quad BF^g = \Delta W^f = f_r \cdot \Delta r \cdot W + f_{r^f} \cdot \Delta r^f \cdot W + f(\cdot) \cdot \Delta W$$

Adding a stochastic term (u) and ignoring the wealth effect a linear specification of this portfolio model is:

$$(7) \quad BF^g = a_0 + a_1 \Delta r + a_2 \Delta r^f + u .$$

This approach has been tested extensively and could be improved by inclusion of further explanatory variables as, for instance, the balance of current account (BC) to represent the need to finance foreign trade, or the velocity of money (V) to reflect domestic credit conditions. Strictly speaking, these extensions are ad hoc and not justified by the portfolio balance model. The fact, however, that these extensions turned out to be very important in the empirical analysis indicates the need to expand the theoretical horizon of international capital flow movements beyond the portfolio balance model.

2.3 MONETARY APPROACH TO BALANCE OF PAYMENTS THEORY

Another way of thinking about balance-of-payments theory is the so-called "monetary approach". With main contributions by Mundell (1968) and Johnson (1973), the central proposition of this theory is the view of balance of payments as a monetary phenomenon in an international monetary economy and thus is to be analyzed with the tools of monetary theory. To some extent this is a revival of the classical price-specie-flow mechanism of David Hume.

The monetary approach focuses on the supply and demand relationships for money in an open economy. In equilibrium the demand for money ($L(\cdot)$) is matched by a domestic (D) and a foreign (F) supply component:

$$(8) \quad L(\cdot) = F + D .$$

Taking differences on both sides of (8), substituting (4), and solving in terms of net capital flows we obtain

$$(9) \quad BF = \Delta L(\cdot) - (\Delta D + BC) .$$

This relationship states that net international capital flows are caused essentially by an excess demand for money. Although in this most stringent formulation the monetary approach assumes no restrictions on capital mobility this assumption can be relaxed by introducing an offset coefficient c indicating to what extent variations in the money supply - stemming either from the domestic component or the current account balance - can be offset by international capital flows:

$$(10) \quad BF = c(\Delta L(\cdot) - (\Delta D + BC)) .$$

Some further aspects of the monetary approach should be mentioned. First, since according to (8) the demand for money is a stock demand, international capital movements have to be viewed as stock adjustment disequilibrium phenomena. Second, the monetary approach stresses the effect of domestic credit creation or destruction by the monetary authorities on international capital flows. Third, the monetary approach concentrates on the long run results of disturbances in the money market in that it makes statements of the new equilibrium positions after full adjustment has taken place. Fourth, the validity of the monetary approach rests on the stability of the demand for money function.

Assuming national income (Y) and the domestic interest rate (i) as main determinants for the demand for money we obtain after linearization of (10) and the addition of a stochastic disturbance term (u) the following basic specification for a net international capital flow equation in the spirit of the monetary approach to the balance of payments:

$$(11) \quad BF = a_0 + a_1(\Delta D + BC) + a_2\Delta Y + a_3\Delta i + u .$$

2.4 THE REDUCED FORM SYNTHESIS

Since both the portfolio model and the monetary approach to balance of payments focus only on the asset allocation motive or the excess demand for money motive while neglecting the respective other aspect a synthesis of both theoretical concepts for international capital movements was proposed by Argy and Kouri (1974) and Kouri and Porter (1974).

In the framework of a general equilibrium model for the financial markets of an open economy the authors arrive at the following equation system:

$$(12a) \quad \Delta L(Y, W, i, i^f) = BC + BF + \Delta D ,$$

$$(12b) \quad BF = BF(\Delta Y, \Delta Y^f, \Delta i, \Delta i^f, W, W^f) .$$

Equation (12a) is the equilibrium condition for the money market analogous to (8) where the demand for money is determined by nominal domestic (Y) and foreign (Y^f) income, nominal domestic (W) and foreign (W^f) wealth, and domestic (i) and foreign (i^f) interest rates. Equation (12b) is the portfolio specification for net international capital flows (BF), the difference between domestic demand for foreign bonds and the foreign demand for domestic bonds.

A specific feature of the approach of the authors is the solution of equation system (12) for the domestic interest rate (i) and net international capital flows (BF) in terms of the variables specified as exogenous: foreign interest rate (i^f), balance of current account (BC), net domestic assets of monetary authorities (D), nominal domestic (Y) and foreign (Y^f) income, nominal domestic (W) and foreign (W^f) wealth. Omitting the wealth variables

and foreign income we obtain after linearization the following econometric specification /3/:

$$(13a) \quad BF = a_0 + a_1(\Delta D + BC) + a_2 \Delta i^f + a_3 \Delta Y + u_1 ,$$

$$(13b) \quad \Delta i = b_0 + b_1(\Delta D + BC) + b_2 \Delta i^f + b_3 \Delta Y + u_2 .$$

Since the final result of this analysis are two reduced form equations we call this approach the reduced form synthesis. As discussed by Kouri and Porter (1974) this specification overcomes a number of problems associated with the pure portfolio specification (7). The reduced form character of equations (13) eliminates the problem of simultaneous equation bias. The capital flow equation is defined even for the case that domestic and foreign bonds are perfect substitutes. Income fluctuations, domestic monetary policy and the current account balance affect the capital account directly instead of indirectly through the interest rate.

2.5 A STRUCTURAL FORM SYNTHESIS BY A DISEQUILIBRIUM MODEL

The synthesis of portfolio model and monetary approach to balance of payments by Argy, Kouri, and Porter in a reduced form specification deserves some more discussion.

One issue is the inclusion of additional explanatory variables. Exchange-rate variations and expectations have caused considerable speculative capital flows over the recent years. Kouri and Porter (1974) attempted to isolate these influences by dummy variables. An explicit specification of the

effect of exchange-rate variations on international capital movements certainly would be desirable.

Wealth effects are usually neglected due to measurement problems but attempts should be made to approximate the impact of wealth variations on international capital movements.

Government budget deficits affect international capital flows directly if they are financed by capital imports and indirectly if they are financed by domestic credit.

Another issue is the reduced form specification of the econometric equations. Although this approach overcomes problems with a simultaneous estimation bias other statistical estimation aspects as structural changes and efficiency gains by imposing a structure should not be overlooked either.

Reduced form estimation seems to be appropriate if we are uncertain about the structural specification of the system. But whenever we are able to specify a structure of a system as it is done in the general equilibrium model of Argy, Kouri, and Porter this information should be used as prior restrictions on the parameter space and thus the structural form should be preferred for estimation since we have to expect efficiency gains.

A more serious problem, however, seems to be the fact that the set of exogenous variables in the reduced form is not unique. Which variables are to be treated as exogenous depends on the scope of the model and therefore may vary from one application to another. Most of the independent variables in (13) can be endogenized, notably the change in domestic assets by a reaction function of the monetary authorities as proposed by Argy and Kouri (1974), and this would

change the reduced form specification.

This deficiency of the reduced form approach is the starting point for our proposition to reformulate the model for international capital movements in such a way that the synthesis of portfolio model and moneatry approach to balance of payments is retained but the proposed specification can be given a structural interpretation.

An essential feature of our model is the proposition that the demand for foreign financial assets is not only based on the portfolio decision of the markets for domestic and foreign bonds but reflects also spillover effects from a non-clearing money market /4/.

We are considering an economy with a commodity market and markets for the financial assets money, domestic bonds, and foreign bonds. At the beginning of each planning period decisions are made based on all available information and expectations leading to market clearing prices and interest rates. In particular the equilibrium interest rate \bar{i}^e clearing the money market and the corresponding demand for foreign bonds \bar{BF}^n (the "notional demand" in the terminology of Barro and Grossman (1977)) are determined by the money market equilibrium condition and the demand for foreign bonds as determined by the portfolio model:

$$(14a) \quad \Delta L(\bar{Y}, \bar{W}, \bar{i}^e, \bar{i}^f) = \bar{BC} + \bar{BF}^n + \Delta \bar{D} ,$$

$$(14b) \quad \bar{BF}^n = BF^n(\Delta \bar{i}^e, \Delta \bar{i}^f, \bar{W}, \bar{W}^f)$$

The bars denote the expected values at the start of each planning period based on all available information at this time. Actual values of these planning

variables may differ from the expected values. Unanticipated disturbances in the commodity market may occur or the current account balance or the behavior of the monetary authorities may be different from the expected projections. In a general equilibrium framework the domestic interest rate and the demand for foreign bonds would adjust to new equilibrium levels that are consistent with the new market situation. A major argument of our model, however, is the proposal that interest rates may be rigid and thus disequilibria in the asset markets may occur. Especially in small countries interest rates may not reflect supply and demand conditions in the money market since often they are subject to the control of monetary authorities.

We assume the existence of three financial assets in the economy, namely money, domestic bonds, and foreign bonds /5/.

The equilibrium interest rate corresponding to the expectations at the beginning of the planning period (\overline{BC} , \overline{BF} , $\overline{\Delta D}$, \overline{Y} , \overline{W}) is \overline{i}^e . The equilibrium interest rate for the actual variables (BC , BF , ΔD , Y , W) would be i^e . Because of rigidities the actual interest rate i is not market clearing and the following disequilibrium M^d in the money market occurs:

$$(15a) \quad M^d = BC + BF + \Delta D - \Delta L(Y, W, i, i^e)$$

Given the budget constraint for total financial assets the failure of the money market to clear affects all other markets for financial assets. In particular, the spillover effect on the foreign bond market is:

$$(15b) \quad BF^d = - dM^d$$

where BF^d is the disequilibrium on the market for foreign bonds.

Coefficient d measures the extent to which the money market disequilibrium is compensated by the market for foreign bonds. It reflects both adjustments made on the domestic bond market and institutional restrictions for international capital movements.

Thus the actual or effective demand for foreign bonds BF is composed of an asset allocation component (the notional demand for foreign bonds) and a monetary component (the spillover effect caused by a money market in disequilibrium):

$$(16) \quad BF = BF^N + BF^d$$
$$= BF^N + d\{\Delta L(Y, W, i, i^f) - (\Delta D + BC) - BF^N\}$$
$$= (1 - d)BF^N + d\{\Delta L(Y, W, i, i^f) - (\Delta D + BC)\} .$$

This specification indicates the relative importance of monetary and asset allocation components in the determination of international capital flows. Parameter d is a measure to what extent disturbances in the money market are offset by additional international capital movements and is therefore called the offset coefficient. Substituting (14b) for the notional demand for foreign bonds into (16) we obtain

$$(17) \quad BF = BF(\Delta D + BC, \Delta Y, \Delta i, \Delta i^f, W, W^f) .$$

Replacing interest rates by the broader concept of returns of assets which also take into account exchange rate variations and introducing exchange rate changes \dot{e} as a proxy for explicit speculative capital movements the proposed disequilibrium model for international capital flows is specified as follows:

$$(18) \quad BF = BF(\Delta D + BC, \Delta Y, \Delta r, \Delta r^f, W, W^f, \dot{e}) .$$

This model represents also a synthesis of portfolio model and monetary approach to balance of payments but can be given a structural interpretation. In addition disequilibrium conditions in the various markets are allowed.

3. ECONOMETRIC ANALYSIS

3.1 ESTIMATING EQUATIONS OF THE STRUCTURAL FORM SYNTHESIS MODEL

For an econometric analysis of the structural form synthesis model of international capital flows we propose the following three linear estimation forms of the general specification (18):

$$(19a) \quad BF = a_0 + a_1(\Delta D + BC) + a_2\Delta Y + a_3\Delta(r - r^f)W + a_4\Delta(r - r^f)W^f + a_5e + u_1 ,$$

$$(19b) \quad BF = b_0 + b_1(\Delta D + BC) + b_2\Delta Y + b_3\Delta(r - r^f)(W - W^f) + b_4e + u_2 ,$$

$$(19c) \quad BF = c_0 + c_1(\Delta D + BC) + c_2\Delta Y + c_3\Delta(r - r^f) + c_4e + u_3 .$$

Estimation form (19a) is the straightforward linearization of (18) with asset returns entering as differences. The variables ($\Delta D + BC$), changes in domestic assets of monetary authorities and current account balance, and ΔY , changes in nominal GNP, take care of the disequilibrium condition on the money

market. The terms with changes in the difference between domestic and foreign asset returns are attributed to the asset allocation component. In (19a) and (19b) they are scaled by domestic and foreign wealth. Percentage changes in the market exchange rate \hat{e} approximate the causes of speculative international capital movements.

Regarding the signs of the coefficients to be estimated we expect the variable ($\Delta D + BC$) to have a negative impact since the corresponding parameter - the offset coefficient - indicates the extent of offsetting capital movements due to changes in domestic assets of monetary authorities and the current account balance. Increases in nominal GNP should have a positive effect on capital flows since they increase the demand for money. A positive interest differential will attract foreign assets. Growth of domestic wealth should cause capital inflows whereas an increase in foreign wealth should lead to capital outflows. Revaluation of a country's currency makes asset holdings in this denomination more attractive and should therefore show up in a positive sign for the variable \hat{e} .

3.2 SOURCES AND DEFINITIONS OF VARIABLES

The data source used is the IFS Datatape of October 1977 provided by the IMF. The sample contains annual data from 1958 to 1976. All variables are converted into US Dollars by the appropriate market exchange rate. Table 1 contains a listing of the symbols and description of variables used in the model. Some variable definitions need further explanation.

Long-term interest rates were used since short-term rates were not available for all countries. As the return on foreign bonds will depend not only on the interest rate but also on exchange rate movements the return on financial assets is defined as the interest rate plus the percentage change of the market exchange rate . The foreign interest rate facing a country was computed as the GNP-weighted domestic interest rates of the seven largest industrial countries (US, Japan, Germany, France, United Kingdom, Italy, Canada).

Special attention was given to wealth variables. Lacking comparable data on financial wealth a proxy variable was constructed from nominal GNP figures by calculating a smooth or "permanent GNP" series by exponential smoothing with trend correction, g being the average exponential growth over the sample period:

$$(20) \quad W_t = W_{t-1}(1 + g) + 0.3\{Y_t - W_{t-1}(1 + g)\} .$$

Foreign wealth is defined as the sum of the wealth series of the above mentioned seven largest industrial countries.

Total net capital flows were calculated from changes in a country's foreign reserves minus the current account balance. The series thus obtained therefore contain errors and omissions /6/. A disaggregation into private and public, short- and long-term capital movements, and direct investments certainly would be desirable, however, for most countries no consistent definitions according to such a classification are available over a longer sample period.

Table 1: Symbols and Description of Variables

BC	Balance of current account
BF	Net international capital flows
BF	Gross international capital flows
D	Domestic assets of monetary authorities
e	Market exchange rate
e	Forward exchange rate
F	Foreign assets of monetary authorities
i	Domestic interest rate
i	Foreign interest rate
L	Demand for money
M	Monetary base
r	Domestic return on financial assets
r	Foreign return on financial assets
R	Risk factor
u	Stochastic disturbance term
w	Foreign wealth
w	Total wealth
y	Domestic GNP, current prices
y	Foreign GNP, current prices
v	Income-velocity of money
z	Domestic policy targets

3.3 ESTIMATION METHOD

Periods of excessive speculative capital movements, administrative restrictions, the shift from fixed to floating exchange-rates, and other specifically institutional factors question classical linear regression as an appropriate parameter estimation technique. The main reason for concern is the handling of these specific events in the sample period. One might suggest to incorporate such singular details either by means of dummy variables or by prior restrictions on the parameters. This, however, increases the danger of overfitting with no improvement in the forecasting behavior despite a seemingly better fit over the sample period. Instead of this we are proposing a different approach.

Sticking strictly to the specifications derived from the theory of international capital movements we attempt to identify statistical evidence of those systematic influences on capital flows that are independent of singular events. In a forecasting exercise, however, we add any available information about specific determinants as stochastic prior restrictions on the endogenous capital flow variables to the structural capital flow model (see Schleicher 1976, 1978).

As a consequence of this specification principle we are looking for an estimator which pays less attention to singular disturbances. An obvious choice is robust regression which minimizes the absolute instead of the squared error sum. The robust estimator used is of the iterative weighted least squares estimator type proposed by Fair (1974).

The basic concept of this estimator is the approximation of the minimization of the absolute error sum by a weighted least squares problem, the weights being reciprocals of the estimated residuals:

$$(21) \quad \min \sum |u_i| \sim \min \sum \frac{u_i^2}{|a_i|}$$

To ensure convergence the weighted least squares problem is solved five times where the weights are computed from the estimated residuals of the previous iteration. Ordinary least squares are used as an initial estimate. To avoid problems with estimated residuals close to zero a lower bound is put on the absolute value of the estimated residuals used as weights.

4. EMPIRICAL RESULTS

The proposed disequilibrium model for international capital movements was tested for the sixteen major industrial countries. The best results of the three estimation forms (19a) - (19c) are summarized in Table 2. The robust regression technique as described in Section 3.3 was used as parameter estimation method on annual data ranging from 1958 to 1976.

The first two explanatory variables in Table 2 represent the monetary element in the model, namely supply and demand on the money market. Interest rate and wealth effects are contained in variables 3 to 6. They stem from the portfolio model and are therefore attributed to the asset allocation decision. Also, these variables incorporate speculative elements since all interest rates are corrected for exchange rate variations. In addition, variable 7, the

Abbreviations:

R² ... multiple correlation coefficient
 R̄² ... corrected multiple correlation coefficient
 SE ... estimated standard error of residuals

Table 2: Estimation Results

	R ²	SE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
AUSTRIA	.834	.786	.51941	-.78651 (-.02716)	.07532 (.01137)	.04774 (.00338)	-.00103 (.0016)				.09287 (.04139)
BELGIUM	.953	.944	.28809	-.96762 (.0472)	.19457 (.00441)						
CANADA	.997	.997	.30517	-.96198 (.06685)	.01892 (.01385)						
DENMARK	.976	.969	.25171	-.85736 (.02088)	.05637 (.00829)	.00448 (.00076)	-.00005 (.00001)				
FINLAND	.994	.993	.19490	-.92313 (.00675)	.02648 (.00287)						
FRANCE	.661	.554	.95114	-.74738 (.04619)	.06719 (.00815)	.07621 (.02213)	-.01587 (.00213)				
GERMANY	.857	.816	1.03663	-1.11686 (.03392)	-.14534 (.01805)	.01469 (.00239)	-.00132 (.00043)				
ITALY	.904	.877	.80751	-.83459 (.01349)	.30492 (.01101)	-.00711 (.00106)	-.00025 (.00005)				
JAPAN	.888	.865	.75234	-.69039 (.01980)	.06759 (.003367)						
NETHERLANDS	.989	.984	.27623	-.91712 (.01088)	.04531 (.00341)	.01122 (.00137)	-.00016 (.00005)				
NORWAY	.996	.995	.22450	-.99447 (.01187)	.08245 (.00870)						
SWEDEN	.983	.976	.29564	-.99168 (.03369)	.11632 (.01045)	.03405 (.01550)	-.00054 (.00036)				
SWITZER- LAND	.776	.731	.43927	-1.19936 (.06233)	.24806 (.01531)						
UNITED KINGDOM	.926	.910	.67028	-.70798 (.3726)	.04242 (.00659)						
USA	.926	.898	1.11184	-.71154 (.01159)	.03161 (.00417)	.00092 (.00049)	-.00106 (.00045)				

percentage change in the market exchange rate, was tested for evidence of explicit speculative capital flows caused by expected exchange rate fluctuations. In the case of the U.S. this variable is replaced by variable 8, the relative difference between forward and market exchange rate of Germany. For each estimated parameter the estimate, its standard deviation, and the standardized beta-coefficient as a measure of the relative importance of the corresponding variable are reported.

The most important result seems to be that for all sixteen countries significant influences of both the monetary and portfolio elements were found as causes for international capital flows. This evidence did not come up in earlier studies of international capital movements dealing with a smaller sample of countries.

Also, it is remarkable to look at the relative importance of monetary elements versus portfolio and speculative elements in the various countries as measured by the beta-coefficient /7/. With the exception of Denmark and Sweden, monetary elements dominate in the small open economies. Typical examples are Norway and Finland. Portfolio and speculative elements seem to be more important for the larger industrial countries except for Canada and Japan. Speculative factors as causes for international capital flows seem to be of special importance in Austria and Switzerland, but also in Germany, Sweden, the U.K., and the U.S. Monetary causes seem to be least important in Australia and France.

The coefficient of variable 1, the offset coefficient, is an indicator to what extent rigidities in the domestic money market (mainly caused by rigid interest rates) cause spillover effects in the foreign bond market. This coefficient is highly significant for all countries. There are, however,

differences in size. High spillover effects (signalled by offset coefficients close to minus one) were estimated for for most of the small open economies and, in addition, for Canada and Germany. The smallest impacts of disturbances in the money market were found for France and Sweden.

The overall explanatory power of the model seems to be very high. On the ground of arguments discussed earlier no dummy variables were used to improve the fit of the equations and no ad hoc specifications were made. With the exception of Belgium, France, and Switzerland all equations explain more than 80% of the variance of international capital movements in the sample period. For more than half of the countries this explanation amounts to over 90%.

5. CONCLUSIONS

Starting with the two major recent developments in the theory of international capital movements, namely the portfolio model and the monetary approach to the balance of payments, we analyzed the "reduced form synthesis" of both concepts as proposed by Argy, Kouri, and Porter. As a complement we propose a disequilibrium model which emphasizes a structural specification and thus overcomes some problems inherent in the reduced form model. In addition, the disequilibrium model enables empirical tests of the relative importance of monetary and portfolio allocation motives as causes for international capital flows.

In all sixteen countries considered the estimation results stress the importance of both monetary and asset allocation aspects. For each country

significant influences of current account balance, asset behavior of monetary authorities, national income, interest rates, and exchange-rates on international capital movements could be traced. In addition, for most countries wealth effects and explicit speculative factors enter the model. The complete system is highly interdependent via interest rates, exchange-rates, and wealth effects.

Despite the fact of large disturbances by singular speculative or institutional events our empirical analysis reveals strong evidence of systematic influences as causes for international capital flows. This result was obtained by using a robust estimation technique that fades out singular disturbances in the sample period. On the other hand, we propose for forecasting purposes a statistical technique that adds any available information about such singular events as prior restrictions to the structural model.

FOOTNOTES

- /1/ In their basic specification Argy and Kouri (1974) explain changes in net domestic assets by current account, capital account, capacity utilization rate, and a time trend. Herring and Marston (1977) present various versions of reaction functions for Germany using quarterly data. Besides changes in foreign reserves they include in their functions the rate of inflation, changes in manufacturing orders, changes in trend income, changes in currency holdings, and the required reserve rate. Hickman and Schleicher (1977) made the change in domestic assets dependent on the change in foreign assets, in long run nominal GNP, percentage change of real GNP, percentage change of consumer prices, and of net government borrowings.
- /2/ The return on foreign financial assets is based not only on the interest rate but also on exchange rate changes.
- /3/ Kouri and Porter (1974) estimated separate coefficients on the current account balance and on the change in domestic assets instead of a single coefficient on their sum. We prefer the latter approach because the offset coefficient should be the same whether the change in the domestic monetary base stems from current account or changes in net domestic assets.
- /4/ See Arndt (1978) for a disequilibrium model to analyze exchange rate dynamics.
- /5/ The basic results of the model also hold for a more complete financial sector.
- /6/ Errors and omissions in the balance of payments are usually considered as not explicitly measured capital flows.
- /7/ Cf. Goldberger (1964), pp. 197-198.

REFERENCES

- Aliber, R.Z. (ed.), National Monetary Policies and the International Financial System, Chicago, Ill.: University of Chicago Press, 1974.
- Amano, A., "International Capital Movements: Theory and Estimation", in R.J. Ball (ed.), The International Linkage of National Economic Models, Amsterdam: North-Holland, 1973, 283-328.
- Argy, V. and Kouri, P.J.K., "Sterilization Policies and the Volatility in International Reserves", in R.Z. Aliber (ed.), National Monetary Policies and the International Financial System, Chicago, Ill.: University of Chicago Press, 1974.
- Arndt, S.W., "On Exchange Rate Dynamics", in E. Claassen and P. Salin (eds.), Asymmetries in the International Economy, forthcoming 1978.
- Askari, H. and F. Modigliani, "A Note on Capital Movements and the Relation of Spread in Spot and Forward Rates to Variations in the Short-Term Interest Differential", Kyklos 30 (1977), 38-50.
- Ball, R.J. (ed.), The International Linkage of National Economic Models, Amsterdam: North-Holland, 1973.
- Barro, R.J. and H.I. Grossman, Money, Employment and Inflation, Cambridge: Cambridge University Press, 1976.
- Branson, W.H., Financial Capital Flows in the U.S. Balance of Payments, Amsterdam: North-Holland, 1968.
- Branson, W.H., "Monetary Policy and the New View of International Capital Movements", Brookings Papers on Economic Activity 1 (1970), 235-262.
- Branson, W.H. and R.D. Hill, Capital Movements in the OECD Area, Paris: OECD Occasional Studies, 1971.
- Claassen, E. and P. Salin (eds.), Recent Issues in International Monetary Economics, Amsterdam: North-Holland, 1976.
- Fair, R.C., "On the Robust Estimation of Econometric Models", Annals of Economic and Social Measurement 3 (1974), 668-677.
- Fratianni, M., "A Note on the Theory of Offsetting Capital Flows", Journal of Monetary Economics 3 (1977), 133-138.
- Frenkel, J.A. and H.G. Johnson (eds.), The Monetary Approach to the Balance of Payments, London: Allen and Unwin, 1976.
- Glueck, H. and S. Schleicher, "Capital Flow Equations for Major Industrial Countries", Paper presented to the Eighth Annual Meeting of Project LINK, Venice, 1976.

- Goldberger, A.S., *Econometric Theory*, New York: Wiley, 1964.
- De Grauwe, P., "The Interaction of Monetary Policies in a Group of European Countries", *Journal of International Economics* 5 (1975), 207-228.
- Hahn, F.H., "The Monetary Approach to the Balance of Payments", *Journal of International Economics* 7 (1977), 231-249.
- Helliwell, J., "Trade, Capital Flows, and Migration as Channels for International Transmission of Stabilization Policies", in A. Ando et al. (eds.), *International Aspects of Stabilization Policies*, Boston, Mass.: Federal Reserve Bank of Boston, 1974.
- Herring, R.J. and R.C. Marston, *National Monetary Policies and International Financial Markets*, Amsterdam: North-Holland, 1977.
- Hickman, B.G. and S. Schleicher, "The Interdependence of National Economies: Evidence from the LINK-Project", Paper presented to the Conference on "The Economic Crisis of the 1970's: Lessons for Stabilization Policy", Baden, Austria, 1977.
- Hodjera, Z., "International Short-Term Capital Movements: A Survey of Theory and Empirical Analysis", *IMF Staff Papers* 20 (1973), 683-740.
- Hodjera, Z., "Alternative Approaches in the Analysis of International Capital Movements: A Case Study of Austria and France", *IMF Staff Papers* 23 (1976), 598-623.
- Johnson, H.G., *Macroeconomics and Monetary Theory*, London: Gray-Mills, 1971.
- Johnson, H.G., "The Monetary Approach to Balance-of-Payments Theory", in M.C. Connolly and A.K. Swoboda (eds.), *International Trade and Money*, London: Allen and Unwin, 1973, 206-224.
- Johnson, H.G., "The Monetary Approach to the Balance of Payments - A Nontechnical Guide", *Journal of International Economics* 7 (1977), 251-268.
- Jorgenson, D.W., "Capital Theory and Investment Behavior", *American Economic Review* 53 (1963), 247-259.
- Keynes, J.M., *The General Theory of Employment, Interest, and Money*, London: Macmillan, 1936.
- Kouri, P.J.K., "The Hypothesis of Offsetting Capital Flows: A Case Study of Germany", *Journal of Monetary Economics* 1 (1975), 21-39.
- Kouri, P.J.K. and M.G. Porter, "International Capital Flows and Portfolio Equilibrium", *Journal of Political Economy* 82 (1974), 443-467.
- McKinnon, R.I., "Sterilization in Three Dimensions: Major Trading Countries, Euro-Currencies, and the United States", in R.Z. Aliber (ed.), *National Monetary Policies and the International Financial System*, Chicago, Ill.: University of Chicago Press, 1974.

- Leamer, E.E. and R.M. Stern, Quantitative International Economics, Boston: Allyn and Bacon, 1970.
- Lybeck, J.A., A Disequilibrium Model of the Swedish Financial Sector, Stockholm: EFI, 1975.
- Markowitz, H.M., Portfolio Selection: Efficient Diversification of Investments, New York: Wiley, 1959.
- Mundell, R.A., International Economics, London: Macmillan, 1968.
- Porter, M.G., "Capital Flows as an Offset to Monetary Policy: The German Experience", IMF Staff Papers 19 (1972), 395-424.
- Rothenberg, T.J., Efficient Estimation With A Priori Information, New Haven: Yale University Press, 1973.
- Sawyer, J.A., "The Invisible Components of the Current Account of the Balance of International Payments", in R.J. Ball (ed.), The International Linkage of National Economic Models, Amsterdam: North-Holland, 1973, 324-366.
- Schleicher, S., "Prior Information in Forecasting with Econometric Models", Research Memorandum No. 93, Institute for Advanced Studies, Vienna, 1975.
- Schleicher, S., Sequential Estimation in Econometric Model Building, forthcoming 1978.
- Spitaeller, E., "A Survey of Recent Quantitative Studies of Long-Term Capital Movements", IMF Staff Papers 18 (1971), 189-219.
- Tobin, J., "Liquidity Preference as Behavior Towards Risk", Review of Economic Studies 25 (1958).
- Tobin, J., "The Theory of Portfolio Selection", in F.H. Hahn and F.P.R. Brechling (eds.), The Theory of Interest Rates, London: Macmillan, 1965.
- Waelbroeck, J. (ed.), The Models of Project LINK, Amsterdam: North-Holland, 1976.

APPENDIX A: Equations

A. AUSTRALIA

A.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$_{AL} = F(DDBC\$_{AL}, GNP_{AL}/EM_{AL}-GNP_{AL[1]}/EM_{AL[1]},$$
$$(RLD\$_{AL}-RLD\$_{AL[1]})*GNPP\$_{AL},$$
$$(RLD\$_{AL}-RLD\$_{AL[1]})*GNPP\$_{7})$$

COEFFICIENT	ESTIMATE	STAND.DEV.
-------------	----------	------------

A1	-.78651	.02716
A2	.07532	.01137
A3	.04774	.00738
A4	-.00103	.00016
A5	.09287	.04439

SE	.51941	DW 1.24	R2 .834	R2C .786
----	--------	---------	---------	----------

1958	- 1976
------	--------

A.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RESS\$_{AL} = RESS\$_{AL[1]} + BC\$_{AL} + BF\$_{AL}$$

A.3 CHG. IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$DDBC\$_{AL} = DAM_{AL}/EM_{AL} - DAM_{AL[1]}/EM_{AL[1]} + BC\$_{AL}$$

A.4 PERMANENT GNP BILL AL\$

$$GNPP_{AL} = (1+.088)*GNPP_{AL[1]} + .3*(GNP_{AL}-(1+.088)*GNPP_{AL[1]})$$

A.5 FOREIGN PERMANENT GNP BILL US\$

$$GNPP\$_{AL} = GNPP_{AL}/EM_{AL}$$

A.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$GNPP\$_{7} = GNPP\$_{US} + GNPP\$_{JA} + GNPP\$_{GE} + GNPP\$_{FR} +$$
$$+ GNPP\$_{UK} + GNPP\$_{CA} + GNPP\$_{IT}$$

A.7 LONG TERM INTEREST RATE %

$$RL\$:AL = RL:AL - (EM:AL - EM:AL[1]) / EM:AL[1] * 100$$

A.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545*RL\$:US + .109*RL\$:JA + .103*RL\$:GE + .079*RL\$:FR + \\ + .068*RL\$:UK + .051*RL\$:IT + .045*RL\$:CA$$

A.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:AL = RL\$:AL - RL\$:7$$

B. AUSTRIA

B.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$
BF\$:AU = H(DDBC\$:AU, GNP:AU/EM:AU-GNP:AU[1]/EM:AU[1],
(RLD:AU-RLD:AU[1]), (EM:AU-EM:AU[1])/EM:AU[1]*100)

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.96762	.04472
A2	.19457	.00641
A3	.05354	.02522
A4	.05394	.00376

SE .28809 DW 2.10 R2 .953 R2C .944

1958 - 1976

B.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

RES\$:AU = RES\$:AU[1] + BC\$:AU + BF\$:AU

B.3 CHG. IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

DDBC\$:AU = DAM:AU/EM:AU - DAM:AU[1]/EM:AU[1] + BC\$:AU

B.4 PERMANENT GNP BILL AS

GNPP:AU = (1+.097)*GNPP:AU[1] + .3*(GNP:AU-(1+.097)*GNPP:AU[1])

B.5 FOREIGN PERMANENT GNP BILL US\$

GNPP\$:AU = GNPP:AU/EM:AU

B.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

GNPP\$:7 = GNPP\$:US + GNPP\$:JA + GNPP\$:GE + GNPP\$:FR +
+ GNPP\$:UK + GNPP\$:CA + GNPP\$:IT

B.7 LONG TERM INTEREST RATE %

$$RL\$:AU = RL:AU - (EM:AU - EM:AU[1]) / EM:AU[1] * 100$$

B.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

B.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:AU = RL\$:AU - RL\$:7$$

C. BELGIUM

C.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$_{BE} = F(DDBC\$_{BE}, GNP_{BE}/EM_{BE}-GNP_{BE[1]}/EM_{BE[1]}, \\ (RLD\$_{BE}-RLD\$_{BE[1]})/100 * (GNPP\$_{BE}-GNPP\$_{7}))$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.69198	.06685
A2	.01842	.01385
A3	.00055	.00033
A4	.06188	.02013

SE .39512 DW 2.39 R2 .526 R2C .431

1958 - 1976

C.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RES\$_{BE} = RES\$_{BE[1]} + BC\$_{BE} + BF\$_{BE}$$

C.3 CHG. IN DOM. ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$DDBC\$_{BE} = DAM_{BE}/EM_{BE} - DAM_{BE[1]}/EM_{BE[1]} + BC\$_{BE}$$

C.4 PERMANENT GNP BILL BF

$$GNPP_{BE} = (1+.079)*GNPP_{BE[1]} + .3*(GNP_{BE}-(1+.079)*GNPP_{BE[1]})$$

C.5 FOREIGN PERMANENT GNP BILL US\$

$$GNPP\$_{BE} = GNPP_{BE}/EM_{BE}$$

C.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$GNPP\$_7 = GNPP\$_{US} + GNPP\$_{JA} + GNPP\$_{GE} + GNPP\$_{FR} + \\ + GNPP\$_{UK} + GNPP\$_{CA} + GNPP\$_{IT}$$

C.7 LONG TERM INTEREST RATE %

$$RL\$:BE = RL:BE - (EM:BE - EM:BE[1]) / EM:BE[1] * 100$$

C.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

C.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:BE = RL\$:BE - RL\$:7$$

D. CANADA

D.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$:CA = H(DDBC\$:CA, GNP:CA/EM:CA-GNP:CA[1]/EM:CA[1], \\ (RLD\$:CA-RLD\$:CA[1])/100 * (GNPP\$:CA-GNPP\$7CA))$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.99711	.00513
A2	.05978	.00082
A3	.00152	.00010

SE .30517 DW 1.99 R2 .997 R2C .997

1958 - 1976

D.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RES\$:CA = RES\$:CA[1] + BC\$:CA + BF\$:CA$$

D.3 CHG. IN DOM. ASSETS OF MA PLUS CURR. ACC. BILL US\$

$$DDBC\$:CA = DAM:CA/EM:CA - DAM:CA[1]/EM:CA[1] + BC\$:CA$$

D.4 PERMANENT GNP BILL CA\$

$$GNPP:CA = (1+.081)*GNPP:CA[1] + .3*(GNP:CA-(1+.081)*GNPP:CA[1])$$

D.5 FOREIGN PERMANENT GNP BILL US\$

$$GNPP\$:CA = GNPP:CA/EM:CA$$

D.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$GNPP\$7CA = GNPP\$:US + GNPP\$:JA + GNPP\$:GE + GNPP\$:FR + \\ + GNPP\$:UK + GNPP\$:IT$$

D.7 LONG TERM INTEREST RATE %

$$RL\$:CA = RL:CA - (EM:CA - EM:CA[1]) / EM:CA[1] * 100$$

D.8 FOREIGN LONG TERM INTEREST RATE

%

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

D.9 LONG TERM INTEREST RATE DIFFERENTIAL

%

$$RLD\$:CA = RL\$:CA - RL\$:7CA$$

E. DENMARK

E.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\begin{aligned} BF\$:DE = & F(DDBC\$:DE, GNP:DE/EM:DE-GNP:DE[1]/EM:DE[1], \\ & (RLD\$:DE-RLD\$:DE[1])*GNPP\$:DE, \\ & (RLD\$:DE-RLD\$:DE[1])*GNPP\$:7) \end{aligned}$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.85736	.02088
A2	.05637	.00829
A3	.00448	.00075
A4	-.00005	.00001
A5	.03385	.01051

SE .25171 DW 2.20 R2 .976 R2C .969

1958 - 1976

E.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RESS:DE = RESS:DE[1] + BC\$:DE + BF\$:DE$$

E.3 CHG. IN DOM. ASSETS OF MA PLUS CURR. ACC. BILL US\$

$$DDBC\$:DE = DAM:DE/EM:DE - DAM:DE[1]/EM:DE[1] + BC\$:DE$$

E.4 PERMANENT GNP BILL KR

$$GNPP:DE = (1+.091)*GNPP:DE[1] + .3*(GNP:DE-(1+.091)*GNPP:DE[1])$$

E.5 FOREIGN PERMANENT GNP BILL US\$

$$GNPP\$:DE = GNPP:DE/EM:DE$$

E.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$\begin{aligned} GNPP\$:7 = & GNPP\$:US + GNPP\$:JA + GNPP\$:GE + GNPP\$:FR + \\ & + GNPP\$:UK + GNPP\$:CA + GNPP\$:IT \end{aligned}$$

E.7 LONG TERM INTEREST RATE %

$$RL\$:DE = RL:DE - (EM:DE - EM:DE[1]) / EM:DE[1] * 100$$

E.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

E.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:DE = RL\$:DE - RL\$:7$$

F. FINLAND

F.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$_{FI} = H(DDBC\$_{FI}, GNP:FI/EM:FI-GNP:FI[1]/EM:FI[1], \\ (RLD\$_{FI}-RLD\$_{FI[1]})/100*(GNPP\$_{FI}-GNPP\$_{7}))$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	.92313	.00675
A2	.02648	.00287
A3	.00014	.00004

SE .19490 DW 2.70 R2 .994 R2C .993

1958 - 1976

F.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RES\$_{FI} = RES\$_{FI[1]} + BC\$_{FI} + BF\$_{FI}$$

F.3 CHG. IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$DDBC\$_{FI} = DAM:FI/EM:FI - DAM:FI[1]/EM:FI[1] + BC\$_{FI}$$

F.4 PERMANENT GNP BILL MA

$$GNPP:FI = (1+.107)*GNPP:FI[1] + .3*(GNP:FI-(1+.107)*GNPP:FI[1])$$

F.5 FOREIGN PERMANENT GNP BILL US\$

$$GNPP\$_{FI} = GNPP:FI/EM:FI$$

F.6 FOREIGN PERMANENT GNP (USS) BILL US\$

$$GNPP\$_7 = GNPP\$_{US} + GNPP\$_{JA} + GNPP\$_{GE} + GNPP\$_{FR} + \\ + GNPP\$_{UK} + GNPP\$_{CA} + GNPP\$_{IT}$$

F.7 LONG TERM INTEREST RATE

%

$$RL\$:FI = RD:FI - (EM:FI - EM:FI[1]) / EM:FI[1] * 100$$

F.8 FOREIGN LONG TERM INTEREST RATE

%

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

F.9 LONG TERM INTEREST RATE DIFFERENTIAL

%

$$RLD\$:FI = RL\$:FI - RL\$:7$$

G. FRANCE

G.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\begin{aligned} \text{BF\$:FR} = & H(\text{DDBC\$:FR}, \text{GNP:FR/EM:FR}-\text{GNP:FR[1]}/\text{EM:FR[1]}, \\ & (\text{RLD:FR}-\text{RLD:FR[1]}) * \text{GNPP\$:FR}, \\ & (\text{RLD:FR}-\text{RLD:FR[1]}) * \text{GNPP\$7FR}, \\ & (\text{EM:FR}-\text{EM:FR[1]})/\text{EM:FR[1]} * 100) \end{aligned}$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.47938	.04619
A2	.06219	.00815
A3	.17621	.02213
A4	-.01587	.00213
A5	.02323	.00646

SE .95114 DW 2.11 R2 .661 R2C .564

1958 - 1976

G.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RESS:FR} = \text{RESS:FR[1]} + \text{BC\$:FR} + \text{BF\$:FR}$$

G.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$\text{DDBC\$:FR} = \text{DAM:FR/EM:FR} - \text{DAM:FR[1]}/\text{EM:FR[1]} + \text{BC\$:FR}$$

G.4 PERMANENT GNP BILL FR

$$\text{GNPP:FR} = (1+.102) * \text{GNPP:FR[1]} + .3 * (\text{GNP:FR} - (1+.102) * \text{GNPP:FR[1]})$$

G.5 FOREIGN PERMANENT GNP BILL US\$

$$\text{GNPP\$:FR} = \text{GNPP:FR/EM:FR}$$

G.6 FOREIGN PERMANENT GNP (USS) BILL US\$

$$\begin{aligned} \text{GNPP\$7FR} = & \text{GNPP\$:US} + \text{GNPP\$:JA} + \text{GNPP\$:GE} + \\ & + \text{GNPP\$:UK} + \text{GNPP\$:CA} + \text{GNPP\$:IT} \end{aligned}$$

G.7 LONG TERM INTEREST RATE %

$$\text{RL\$:FR} = \text{RL:FR} - (\text{EM:FR} - \text{EM:FR[1]}) / \text{EM:FR[1]} * 100$$

G.8 FOREIGN LONG TERM INTEREST RATE %

$$\begin{aligned} \text{RL\$:7} = & .545 * \text{RL\$:US} + .109 * \text{RL\$:JA} + .103 * \text{RL\$:GE} + .079 * \text{RL\$:FR} + \\ & + .068 * \text{RL\$:UK} + .051 * \text{RL\$:IT} + .045 * \text{RL\$:CA} \end{aligned}$$

G.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$\text{RLD\$:FR} = \text{RL\$:FR} - \text{RL\$:7FR}$$

H. GERMANY

H.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\begin{aligned} \text{BF\$:GE} &= H(\text{DDBC\$:GE}, \text{GNP:GE}/\text{EM:GE} - \text{GNP:GE[1]}/\text{EM:GE[1]}, \\ &\quad (\text{RLD:GE}-\text{RLD:GE[1]}) * \text{GNPP\$:GE}, \\ &\quad (\text{RLD:GE}-\text{RLD:GE[1]}) * \text{GNPP\$7GE}, \\ &\quad (\text{EM:GE}-\text{EM:GE[1]})/\text{EM:GE[1]} * 100) \end{aligned}$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-1.11686	.03292
A2	.14534	.01805
A3	.01409	.00299
A4	-.00132	.00043
A5	.26865	.09232

SE 1.03663 DW 1.34 R2 .857 R2C .816
1958 - 1976

H.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RES\$:GE} = \text{RESS:GE[1]} + \text{BC\$:GE} + \text{BF\$:GE}$$

H.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$\text{DDBC\$:GE} = \text{DAM:GE}/\text{EM:GE} - \text{DAM:GE[1]}/\text{EM:GE[1]} + \text{BC\$:GE}$$

H.4 PERMANENT GNP BILL DM

$$\text{GNPP:GE} = (1+.090) * \text{GNPP:GE[1]} + .3 * (\text{GNP:GE} - (1+.090) * \text{GNPP:GE[1]})$$

H.5 FOREIGN PERMANENT GNP BILL US\$

$$\text{GNPP\$:GE} = \text{GNPP:GE}/\text{EM:GE}$$

H.6 FOREIGN PERMANENT GNP (US\$) BILL US\$
GNPP\$7GE = GNPP\$:US + GNPP\$:JA + GNPP\$:FR +
+ GNPP\$:UK + GNPP\$:CA + GNPP\$:IT

H.7 LONG TERM INTEREST RATE %
RL\$:GE = RL:GE - (EM:GE - EM:GE[1]) / EM:GE[1] * 100

H.8 FOREIGN LONG TERM INTEREST RATE %
RL\$:7 = .545*RL\$:US + .109*RL\$:JA + .103*RL\$:GE + .079*RL\$:FR +
+ .068*RL\$:UK + .051*RL\$:IT + .045*RL\$:CA

H.9 LONG TERM INTEREST RATE DIFFERENTIAL %
RLD\$:GE = RLS:GE - RLS:7GE

H.10 LONG TERM INTEREST RATE %
RL\$:IT = RL:IT - (EM:IT - EM:IT[1]) / EM:IT[1] * 100

I. ITALY

I.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\begin{aligned} \text{BF\$:IT} = & F(\text{DDBC\$:IT}, \text{GNP:IT/EM:IT}-\text{GNP:IT[1]}/\text{EM:IT[1]}, \\ & (\text{RLD\$:IT}-\text{RLD\$:IT[1]}) * \text{GNPP\$:IT}, \\ & (\text{RLD\$:IT}-\text{RLD\$:IT[1]}) * \text{GNPP\$7IT}) \end{aligned}$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.83459	.01329
A2	.30492	.01101
A3	.00711	.00106
A4	-.00025	.00005
A5	-.62564	.07591

SE .80751 DW 2.21 R2 .904 R2C .877

1958 - 1976

I.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RESS:IT} = \text{RESS:IT[1]} + \text{BC\$:IT} + \text{BF\$:IT}$$

I.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACCT. BILL US\$

$$\text{DDBC\$:IT} = \text{DAM:IT/EM:IT} - \text{DAM:IT[1]/EM:IT[1]} + \text{BC\$:IT}$$

I.4 PERMANENT GNP BILL LIT

$$\text{GNPP:IT} = (1+.097) * \text{GNPP:IT[1]} + .3 * (\text{GNP:IT} - (1+.097) * \text{GNPP:IT[1]})$$

I.5 FOREIGN PERMANENT GNP BILL US\$

$$\text{GNPP\$:IT} = \text{GNPP:IT/EM:IT}$$

I.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$\begin{aligned} \text{GNPP\$7IT} = & \text{GNPP\$:US} + \text{GNPP\$:JA} + \text{GNPP\$:GE} + \text{GNPP\$:FR} + \\ & + \text{GNPP\$:UK} + \text{GNPP\$:CA} \end{aligned}$$

I.7 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

I.8 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:IT = RLS\$:IT - RL\$:7IT$$

J. JAPAN

J.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$:JA = F(DDBC\$:JA, GNP:JA/EM:JA-GNP:JA[1]/EM:JA[1], \\ (RLD\$:JA-RLD\$:JA[1])/100*(GNPP\$:JA-GNPP\$7JA))$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.69039	.01990
A2	.06759	.00367
A3	.00740	.00063
A4	-.09418	.04454

SE .75234 DW 1.87 R2 .888 R2C .865

1958 - 1976

J.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RES\$:JA = RES\$:JA[1] + BC\$:JA + BF\$:JA$$

J.3 CHG. IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$DDBC\$:JA = DAM:JA/EM:JA - DAM:JA[1]/EM:JA[1] + BC\$:JA$$

J.4 PERMANENT GNP BILL YEN

$$GNPP:JA = (1+.140)*GNPP:JA[1] + .3*(GNP:JA-(1+.140)*GNPP:JA[1])$$

J.5 FOREIGN PERMANENT GNP BILL US\$

$$GNPP\$:JA = GNPP:JA/EM:JA$$

J.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$GNPP\$7JA = GNPP\$:US + GNPP\$:GE + GNPP\$:FR + \\ + GNPP\$:UK + GNPP\$:CA + GNPP\$:IT$$

J.7 LONG TERM INTEREST RATE %

$$RL\$:JA = RL:JA - (EM:JA - EM:JA[1]) / EM:JA[1] * 100$$

J.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545 * RL\$:US + .109 * RL\$:JA + .103 * RL\$:GE + .079 * RL\$:FR + \\ + .068 * RL\$:UK + .051 * RL\$:IT + .045 * RL\$:CA$$

J.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:JA = RL\$:JA - RL\$:7JA$$

K. NETHERLANDS

K.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\text{BF\$:NE} = \text{F}(\text{DDBC\$:NE}, \text{GNP:NE}/\text{EM:NE}-\text{GNP:NE[1]}/\text{EM:NE[1]}, \\ (\text{RLD:NE}-\text{RLD:NE[1]}) * \text{GNPP\$:NE}, \\ (\text{RLD:NE}-\text{RLD:NE[1]}) * \text{GNPP\$:7}, \\ (\text{EM:NE}-\text{EM:NE[1]})/\text{EM:NE[1]} * 100)$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.91712	.01088
A2	.04521	.00341
A3	.01122	.00197
A4	-.00016	.00005
A5	.01694	.00263
A6	.07233	.00867

SE .27623 DW 2.08 R2 .989 R2C .984

1958 - 1976

K.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RESS:NE} = \text{RESS:NE[1]} + \text{BC\$:NE} + \text{BF\$:NE}$$

K.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$\text{DDBC\$:NE} = \text{DAM:NE}/\text{EM:NE} - \text{DAM:NE[1]}/\text{EM:NE[1]} + \text{BC\$:NE}$$

K.4 PERMANENT GNP BILL GLD

$$\text{GNPP:NE} = (1+.094) * \text{GNPP:NE[1]} + .3 * (\text{GNP:NE} - (1+.094) * \text{GNPP:NE[1]})$$

K.5 FOREIGN PERMANENT GNP:BILL US\$:

$$\text{GNPP\$:NE} = \text{GNPP:NE}/\text{EM:NE}$$

K.6 FOREIGN PERMANENT GNP (USS) BILL USS

$$\text{GNPP\$:7} = \text{GNPP\$:US} + \text{GNPP\$:JA} + \text{GNPP\$:GE} + \text{GNPP\$:FR} + \\ + \text{GNPP\$:UK} + \text{GNPP\$:CA} + \text{GNPP\$:IT}$$

K.7 LONG TERM INTEREST RATE %

$$\text{RL\$:NE} = \text{RL\$:NE} - (\text{EM:NE} - \text{EM:NE}[1]) / \text{EM:NE}[1] * 100$$

K.8 FOREIGN LONG TERM INTEREST RATE %

$$\text{RL\$:7} = .545 * \text{RL\$:US} + .109 * \text{RL\$:JA} + .103 * \text{RL\$:GE} + .079 * \text{RL\$:FR} + \\ + .068 * \text{RL\$:UK} + .051 * \text{RL\$:IT} + .045 * \text{RL\$:CA}$$

K.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$\text{RLD\$:NE} = \text{RL\$:NE} - \text{RL\$:7}$$

L. NORWAY

L.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$_{NO} = F(DDBC\$_{NO}, GNP_{NO}/EM_{NO}-GNP_{NO[1]}/EM_{NO[1]}, \\ (RLD\$_{NO}-RLD\$_{NO[1]})/100*(GNPP\$_{NO}-GNPP\$_{7}))$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	.99747	.01787
A2	.08245	.00670
A3	.00108	.00026
A4	.00680	.00551

SE .22450 DW 2.56 R2 .996 R2C .995

1958 - 1976

L.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RES\$_{NO} = RES\$_{NO[1]} + BC\$_{NO} + BF\$_{NO}$$

L.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACCT. BILL US\$

$$DDBC\$_{NO} = DAM_{NO}/EM_{NO} - DAM_{NO[1]}/EM_{NO[1]} + BC\$_{NO}$$

L.4 PERMANENT GNP BILL KR

$$GNPP_{NO} = (1+.085)*GNPP_{NO[1]} + .3*(GNP_{NO}-(1+.085)*GNPP_{NO[1]})$$

L.5 FOREIGN PERMANENT GNP:BILL US\$:

$$GNPP\$_{NO} = GNPP_{NO}/EM_{NO}$$

L.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$GNPP\$_7 = GNPP\$_{US} + GNPP\$_{JA} + GNPP\$_{GE} + GNPP\$_{FR} + \\ + GNPP\$_{UK} + GNPP\$_{CA} + GNPP\$_{IT}$$

L.7 LONG TERM INTEREST RATE %

$$RL\$:NO = RL:NO - (EM:NO - EM:NO[1]) / EM:NO[1] * 100$$

L.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545*RL\$:US + .109*RL\$:JA + .103*RL\$:GE + .079*RL\$:FR + \\ + .068*RL\$:UK + .051*RL\$:IT + .045*RL\$:CA$$

L.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:NO = RL\$:NO - RL\$:7$$

L.10 LONG TERM INTEREST RATE %

$$RL\$:SW = RL:SW - (EM:SW - EM:SW[1]) / EM:SW[1] * 100$$

M. SWEDEN

M.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\begin{aligned} \text{BF\$:SW} = & F(\text{DDBC\$:SW}, \text{GNP:SW}/\text{EM:SW}-\text{GNP:SW[1]}/\text{EM:SW[1]}, \\ & (\text{RLD:SW}-\text{RLD:SW[1]}) * \text{GNPP\$:SW}, \\ & (\text{RLD:SW}-\text{RLD:SW[1]}) * \text{GNPP\$:7}, \\ & (\text{EM:SW}-\text{EM:SW[1]})/\text{EM:SW[1]} * 100) \end{aligned}$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.49168	.03569
A2	.11832	.01045
A3	.03405	.01950
A4	-.00054	.00036
A5	.05517	.00586
A6	-.08218	.02017

SE .29564 DW 2.49 R2 .983 R2C .976

1958 - 1976

M.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RESS:SW} = \text{RESS:SW[1]} + \text{BC\$:SW} + \text{BF\$:SW}$$

M.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$\text{DDBC\$:SW} = \text{DAM:SW}/\text{EM:SW} - \text{DAM:SW[1]}/\text{EM:SW[1]} + \text{BC\$:SW}$$

M.4 PERMANENT GNP BILL KR

$$\text{GNPP:SW} = (1+.084) * \text{GNPP:SW[1]} + .3 * (\text{GNP:SW} - (1+.084) * \text{GNPP:SW[1]})$$

M.5 FOREIGN PERMANENT GNP:BILL US\$:

$$\text{GNPP\$:SW} = \text{GNPP:SW}/\text{EM:SW}$$

M.6 FOREIGN PERMANENT GNP (USS)

BILL USS

$$\text{GNPP\$:7} = \text{GNPP\$:US} + \text{GNPP\$:JA} + \text{GNPP\$:GE} + \text{GNPP\$:FR} + \\ + \text{GNPP\$:UK} + \text{GNPP\$:CA} + \text{GNPP\$:IT}$$

M.7 FOREIGN LONG TERM INTEREST RATE

%

$$\text{RL\$:7} = .545 * \text{RL\$:US} + .109 * \text{RL\$:JA} + .103 * \text{RL\$:GE} + .079 * \text{RL\$:FR} + \\ + .068 * \text{RL\$:UK} + .051 * \text{RL\$:IT} + .045 * \text{RL\$:CA}$$

M.8 LONG TERM INTEREST RATE DIFFERENTIAL

%

$$\text{RLD\$:SW} = \text{RL\$:SW} - \text{RL\$:7}$$

N. SWITZERLAND

N.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$BF\$:SZ = H(DDBC\$:SZ, GNP:SZ/EM:SZ-GNP:SZ[1]/EM:SZ[1], \\ (RLD:SZ-RLD:SZ[1])/100*(GNPP\$:SZ-GNPP\$:7), \\ (EM:SZ-EM:SZ[1])/EM:SZ[1]*100)$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-1.19196	.06283
A2	.24806	.01551
A3	.02595	.00421
A4	.08292	.01014

SE .43927 DW 2.02 R2 .776 R2C .731

1958 - 1976

N.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$RESS:SZ = RES$:SZ[1] + BC$:SZ + BF$:SZ$$

N.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$DDBC$:SZ = DAM:SZ/EM:SZ - DAM:SZ[1]/EM:SZ[1] + BC$:SZ$$

N.4 PERMANENT GNP BILL SF

$$GNPP:SZ = (1+.080)*GNPP:SZ[1] + .3*(GNP:SZ-(1+.080)*GNPP:SZ[1])$$

N.5 FOREIGN PERMANENT GNP:BILL US\$:

$$GNPP$:SZ = GNPP:SZ/EM:SZ$$

N.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$GNPP$:7 = GNPP$:US + GNPP$:JA + GNPP$:GE + GNPP$:FR + \\ + GNPP$:UK + GNPP$:CA + GNPP$:IT$$

N.7 LONG TERM INTEREST RATE %

$$RL\$:SZ = RL:SZ - (EM:SZ - EM:SZ[1]) / EM:SZ[1] * 100$$

N.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7 = .545*RL\$:US + .109*RL\$:JA + .103*RL\$:GE + .079*RL\$:FR + \\ + .068*RL\$:UK + .051*RL\$:IT + .045*RL\$:CA$$

N.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:SZ = RL\$:SZ - RL\$:7$$

O. UNITED KINGDOM

O.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\text{BF\$:UK} = \text{H}(\text{DDBC\$:UK}, \text{GNP:UK}/\text{EM:UK}-\text{GNP:UK}[1]/\text{EM:UK}[1], \\ \text{RLD:UK}-\text{RLD:UK}[1], \\ (\text{EM:UK}-\text{EM:UK}[1])/\text{EM:UK}[1]*100)$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.70798	.03756
A2	.04242	.00469
A3	.84554	.11484
A4	.03129	.00387

SE .67028 DW 2.03 R2 .925 R2C .910

1958 - 1976

O.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RES\$:UK} = \text{RES\$:UK}[1] + \text{BC\$:UK} + \text{BF\$:UK}$$

O.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$\text{DDBC\$:UK} = \text{DAM:UK}/\text{EM:UK} - \text{DAM:UK}[1]/\text{EM:UK}[1] + \text{BC\$:UK}$$

O.4 PERMANENT GNP BILL LBS

$$\text{GNPP:UK} = (1+.074)*\text{GNPP:UK}[1] + .3*(\text{GNP:UK}-(1+.074)*\text{GNPP:UK}[1])$$

O.5 FOREIGN PERMANENT GNP:BILL US\$:

$$\text{GNPP\$:UK} = \text{GNPP:UK}/\text{EM:UK}$$

O.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$\text{GNPP\$:7} = \text{GNPP\$:US} + \text{GNPP\$:JA} + \text{GNPP\$:GE} + \text{GNPP\$:FR} + \\ + \text{GNPP\$:UK} + \text{GNPP\$:CA} + \text{GNPP\$:IT}$$

0.7 LONG TERM INTEREST RATE %

$$RL\$:UK = RL:UK - (EM:UK - EM:UK[1]) / EM:UK[1] * 100$$

0.8 FOREIGN LONG TERM INTEREST RATE %

$$RL\$:7UK = .584 * RL\$:US + .117 * RL\$:JA + .111 * RL\$:GE + .084 * RL\$:FR + \\ + .055 * RL\$:IT + .049 * RL\$:CA$$

0.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$RLD\$:UK = RL\$:UK - RL\$:7UK$$

P. UNITED STATES

P.1 NET INTERNATIONAL CAPITAL FLOWS BILL US\$

$$\begin{aligned} \text{BF\$:US} = & F(\text{DDBC\$:US}, \text{GNP:US}/\text{EM:US}-\text{GNP:US}[1]/\text{EM:US}[1], \\ & (\text{RLD\$:US}-\text{RLD\$:US}[1]) * \text{GNPP\$:US}, \\ & (\text{RLD\$:US}-\text{RLD\$:US}[1]) * \text{GNPP\$7US}, \\ & (\text{EF:GE}-\text{EM:GE})/\text{EM:GE} * 100) \end{aligned}$$

COEFFICIENT ESTIMATE STAND.DEV.

A1	-.71454	.01959
A2	.03761	.00417
A3	.00092	.00049
A4	-.00106	.00045
A5	-.70707	.03269
A6	-1.45466	.28230

SE 1.11184 DW 2.70 R2 .926 R2C .898

1958 - 1976

P.2 FOREIGN RESERVES OF MONETARY AUTHORITIES BILL US\$

$$\text{RESS:US} = \text{RESS:US}[1] + \text{BC\$:US} + \text{BF\$:US}$$

P.3 CHG.IN DOM.ASSETS OF MA PLUS CURR.ACC. BILL US\$

$$\text{DDBC\$:US} = \text{DAM:US}/\text{EM:US} - \text{DAM:US}[1]/\text{EM:US}[1] + \text{BC\$:US}$$

P.4 PERMANENT GNP BILL US\$

$$\text{GNPP:US} = (1+.064) * \text{GNPP:US}[1] + .3 * (\text{GNP:US} - (1+.064) * \text{GNPP:US}[1])$$

P.5 FOREIGN PERMANENT GNP BILL US\$

$$\text{GNPP\$:US} = \text{GNPP:US}/\text{EM:US}$$

P.6 FOREIGN PERMANENT GNP (US\$) BILL US\$

$$\text{GNPP\$7US} = \text{GNPP\$:JA} + \text{GNPP\$:GE} + \text{GNPP\$:FR} + \\ + \text{GNPP\$:UK} + \text{GNPP\$:CA} + \text{GNPP\$:IT}$$

P.7 LONG TERM INTEREST RATE %

$$\text{RL\$:US} = \text{RL:US}$$

P.8 FOREIGN LONG TERM INTEREST RATE %

$$\text{RL\$:7US} = .24 * \text{RL\$:JA} + .227 * \text{RL\$:GE} + .172 * \text{RL\$:FR} + \\ + .149 * \text{RL\$:UK} + .112 * \text{RL\$:IT} + .100 * \text{RL\$:CA}$$

P.9 LONG TERM INTEREST RATE DIFFERENTIAL %

$$\text{RLD\$:US} = \text{RL\$:US} - \text{RL\$:7US}$$

APPENDIX B: Data Description

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
BC\$:AL	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-1.398
BC\$:AU	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-1.526
BC\$:BE	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-.304
BC\$:CA	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-4.373
BC\$:DE	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-1.906
BC\$:FI	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-1.163
BC\$:FR	BALANCE OF CURRENT ACCOUNT	1958	1976	BILL OF US\$	-6.033
BC\$:GE	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	3.018
BC\$:IT	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-2.856
BC\$:JA	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	3.706
BC\$:NE	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	2.372
BC\$:NO	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-3.728
BC\$:SW	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-2.424
BC\$:SZ	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	3.501
BC\$:UK	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	-2.642
BC\$:US	BALANCE OF CURRENT ACCOUNT	1956	1976	BILL OF US\$	3.604
BF\$:AL	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	1.312
BF\$:AU	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	1.497
BF\$:BE	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	-.287
BF\$:CA	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	4.891

STS-SYSTEM

FILE EOPDAT

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
BF\$:DE	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	1.944
BF\$:FI	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	1.192
BF\$:FR	NET INTERNATIONAL CAPITAL FLOWS	1958	1976	BILL OF US\$	3.168
BF\$:GE	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$.749
BF\$:IT	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	4.736
BF\$:JA	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$.084
BF\$:ME	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	-2.094
BF\$:NO	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	3.721
BF\$:SW	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	1.838
BF\$:SZ	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	-.936
BF\$:UK	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	1.413
BF\$:US	NET INTERNATIONAL CAPITAL FLOWS	1956	1976	BILL OF US\$	-1.167
DAM:AL	DOMESTIC ASSETS OF MA	1948	1976	BILL OF AL\$	3.316
DAM:AU	DOMESTIC ASSETS OF MA	1948	1976	BILL OF AS	18.370
DAM:BE	DOMESTIC ASSETS OF MA	1950	1976	BILL OF BF	82.200
DAM:CA	DOMESTIC ASSETS OF MA	1948	1976	BILL OF CA\$	5.850
DAM:DE	DOMESTIC ASSETS OF MA	1948	1976	BILL OF KR	7.420
DAM:FI	DOMESTIC ASSETS OF MA	1948	1976	BILL OF MA	.076
DAM:FR	DOMESTIC ASSETS OF MA	1948	1976	BILL OF FR	35.940
DAM:GE	DOMESTIC ASSETS OF MA	1951	1976	BILL OF DM	30.100

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
DAM:IT	DOMESTIC ASSETS OF MA	1955	1976	BILL OF 1000 LI	21.284
DAM:JA	DOMESTIC ASSETS OF MA	1953	1976	BILL OF 1000 YEN	11.018
DAM:NE	DOMESTIC ASSETS OF MA	1948	1976	BILL OF GLD	-3.260
DAM:NO	DOMESTIC ASSETS OF MA	1948	1976	BILL OF KR	3.710
DAM:SI	DOMESTIC ASSETS OF MA	1948	1976	BILL OF KR	14.240
DAM:SZ	DOMESTIC ASSETS OF MA	1948	1976	BILL OF SF	-2.830
DAM:UK	DOMESTIC ASSETS OF MA	1952	1976	BILL OF LBS	8.472
DAM:US	DOMESTIC ASSETS OF MA	1948	1976	BILL OF US\$	100.300
DDBC\$:AL	D(DAM:AL/EM:AL) + BC\$:AL	1956	1976	BILL OF US\$	-629
DDBC\$:AU	D(DAM:AU/EM:AU) + BC\$:AU	1956	1976	BILL OF US\$	-803
DDBC\$:BE	D(DAM:BE/EM:BE) + BC\$:BE	1956	1976	BILL OF US\$.827
DDBC\$:CA	D(DAM:CA/EM:CA) + BC\$:CA	1956	1976	BILL OF US\$	-3.690
DDBC\$:DE	D(DAM:DE/EM:DE) + BC\$:DE	1956	1976	BILL OF US\$	-1.862
DDBC\$:FI	D(DAM:FI/EM:FI) + BC\$:FI	1956	1976	BILL OF US\$	-1.218
DDBC\$:FR	D(DAM:FR/EM:FR) + BC\$:FR	1958	1976	BILL OF US\$	-3.147
DDBC\$:GE	D(DAM:GE/EM:GE) + BC\$:GE	1956	1976	BILL OF US\$	6.356
DDBC\$:IT	D(DAM:IT/EM:IT) + BC\$:IT	1956	1976	BILL OF US\$	-14.154
DDBC\$:JA	D(DAM:JA/EM:JA) + BC\$:JA	1956	1976	BILL OF US\$	4.108
DDBC\$:NE	D(DAM:NE/EM:NE) + BC\$:NE	1956	1976	BILL OF US\$	2.958
DDBC\$:NO	D(DAM:NO/EM:NO) + BC\$:NO	1956	1976	BILL OF US\$	-3.272

STS-SYSTEM

FILE BOPDAT

DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
DDBC\$:SW D(DAM:SW/EM:SW) + BC\$:SW	1956	1976	BILL OF US\$	-1.484
DDBC\$:SZ D(DAM:SZ/EM:SZ) + BC\$:SZ	1956	1976	BILL OF US\$	2.253
DDBC\$:UK D(DAM:UK/EM:UK) + BC\$:UK	1956	1976	BILL OF US\$	-1.362
DDBC\$:US D(DAM:US/EM:US) + BC\$:US	1956	1976	BILL OF US\$	7.504
EF:AL FORWARD EXCHANGE RATE	1907	1907	AL\$ / US\$.000
EF:AU FORWARD EXCHANGE RATE	1967	1976	AS / US\$	--B
EF:BE FORWARD EXCHANGE RATE	1958	1976	BF / US\$	--B
EF:CA FORWARD EXCHANGE RATE	1948	1976	CA\$ / US\$	--B
EF:DE FORWARD EXCHANGE RATE	1973	1976	KR / US\$	--B
EF:FI FORWARD EXCHANGE RATE	1972	1976	MA / US\$	--B
EF:FR FORWARD EXCHANGE RATE	1958	1976	FR / US\$	--B
EF:GE FORWARD EXCHANGE RATE	1953	1976	DK / US\$	--B
EF:IT FORWARD EXCHANGE RATE	1976	1976	1000 LI / US\$	--B
EF:JA FORWARD EXCHANGE RATE	1948	1976	1000 YEN / US\$	--B
EF:NE FORWARD EXCHANGE RATE	1953	1976	GLD / US\$	--B
EF:NO FORWARD EXCHANGE RATE	1976	1976	KR / US\$	--B
EF:SW FORWARD EXCHANGE RATE	1976	1976	KR / US\$	--B
EF:SZ FORWARD EXCHANGE RATE	1959	1976	SF / US\$	--B
EF:UK FORWARD EXCHANGE RATE	1958	1976	LBS / US\$	--B
EM:AL MARKET EXCHANGE RATE RATE	1948	1976	AL\$ / US\$	--AF

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
EM:AU	MARKET EXCHANGE RATE RATE	1948	1976	AS / US\$	--AF 17.940
EM:BE	MARKET EXCHANGE RATE RATE	1948	1976	BF / US\$	--AF 38.604
EM:CA	MARKET EXCHANGE RATE RATE	1948	1976	CA\$ / US\$	--AF .986
EM:DE	MARKET EXCHANGE RATE RATE	1948	1976	KR / US\$	--AF 6.045
EM:FI	MARKET EXCHANGE RATE RATE	1948	1976	MA / US\$	--AF 3.864
EM:FR	MARKET EXCHANGE RATE RATE	1948	1976	FR / US\$	--AF 4.780
EM:GE	MARKET EXCHANGE RATE RATE	1948	1976	DM / US\$	--AF 2.518
EM:IT	MARKET EXCHANGE RATE RATE	1948	1976	1000 LI / US\$	--AF .832
EM:JA	MARKET EXCHANGE RATE RATE	1948	1976	1000 YEN / US\$	--AF .297
EM:NE	MARKET EXCHANGE RATE RATE	1948	1976	GLD / US\$	--AF 2.644
EM:NO	MARKET EXCHANGE RATE RATE	1948	1976	KR / US\$	--AF 5.457
EM:SW	MARKET EXCHANGE RATE RATE	1948	1976	KR / US\$	--AF 4.356
EM:SZ	MARKET EXCHANGE RATE RATE	1948	1976	SF / US\$	--AF 2.500
EM:UK	MARKET EXCHANGE RATE RATE	1948	1976	LBS / US\$	--AF .557
EM:US	MARKET EXCHANGE RATE RATE	1948	1976	US\$ / US\$	--AF 1.000
FAM:AL	FOREIGN ASSETS OF MA	1948	1976	BILL OF AL\$	11 2.772
FAM:AU	FOREIGN ASSETS OF MA	1948	1976	BILL OF AS	11 77.430
FAM:BE	FOREIGN ASSETS OF MA	1950	1976	BILL OF BF	11 226.900
FAM:CA	FOREIGN ASSETS OF MA	1948	1976	BILL OF CA\$	11 5.900
FAM:DE	FOREIGN ASSETS OF MA	1948	1976	BILL OF KR	11 5.370

STS-SYSTEM

FILE BOPDAT

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
FAM:FI	FOREIGN ASSETS OF MA	1948	1976	BILL OF MA	11
FAM:FR	FOREIGN ASSETS OF MA	1948	1976	BILL OF FR	11
FAM:GE	FOREIGN ASSETS OF MA	1951	1976	BILL OF DM	11
FAM:IT	FOREIGN ASSETS OF MA	1955	1976	BILL OF 1000 LI	11
FAM:JA	FOREIGN ASSETS OF MA	1953	1976	BILL OF 1000 YEN	11
FAM:NE	FOREIGN ASSETS OF MA	1948	1976	BILL OF GLD	11
FAM:NO	FOREIGN ASSETS OF MA	1948	1976	BILL OF KR	11
FAM:SW	FOREIGN ASSETS OF MA	1948	1976	BILL OF KR	11
FAM:SZ	FOREIGN ASSETS OF MA	1948	1976	BILL OF SF	11
FAM:UK	FOREIGN ASSETS OF MA	1952	1976	BILL OF LBS	11
FAM:US	FOREIGN ASSETS OF MA	1948	1976	BILL OF US\$	11
GNPP\$::AL	PERMANENT GNP (US\$)	1950	1976	BILL OF US\$	11
GNPP\$::AU	PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	11
GNPP\$::BE	PERMANENT GNP (US\$)	1954	1976	BILL OF US\$	11
GNPP\$::CA	PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	11
GNPP\$::DE	PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	11
GNPP\$::FI	PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	11
GNPP\$::FR	PERMANENT GNP (US\$)	1951	1976	BILL OF US\$	11
GNPP\$::GE	PERMANENT GNP (US\$)	1951	1976	BILL OF US\$	11
GNPP\$::IT	PERMANENT GNP (US\$)	1952	1976	BILL OF US\$	11

DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
GNPP\$:JA PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	547.257
GNPP\$:NE PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	83.336
GNPP\$:NO PERMANENT GNP (US\$)	1951	1976	BILL OF US\$	28.079
GNPP\$:SW PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	68.827
GNPP\$:SZ PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	62.477
GNPP\$:UK PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	183.228
GNPP\$:US PERMANENT GNP (US\$)	1949	1976	BILL OF US\$	1597.968
GNPP\$:7 FOREIGN PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	3435.470
GNPP\$:7FR FOREIGN PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	3263.880
GNPP\$:7GE FOREIGN PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	2981.920
GNPP\$:7IT FOREIGN PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	3288.862
GNPP\$:7JA FOREIGN PERMANENT GNP (US\$)	1952	1976	BILL OF US\$	2888.213
GNPP\$:7UK FOREIGN PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	3252.243
GNPP\$:7US FOREIGN PERMANENT GNP (US\$)	1953	1976	BILL OF US\$	1837.503
GNPP:AL PERMANENT GNP	1950	1976	BILL OF AL\$	61.140
GNPP:AU PERMANENT GNP	1949	1976	BILL OF AS	709.222
GNPP:BE PERMANENT GNP	1954	1976	BILL OF BF	2395.622
GNPP:CA PERMANENT GNP	1949	1976	BILL OF CA\$	169.195
GNPP:DE PERMANENT GNP	1949	1976	BILL OF KR	217.660

STS-SYSTEM

FILE BOPDAT

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
GNPP:FI	PERMANENT GNP	1949	1976	BILL OF MA	99.969
GNPP:FR	PERMANENT GNP	1951	1976	BILL OF FR	1602.463
GNPP:GE	PERMANENT GNP	1951	1976	BILL OF DM	1142.041
GNPP:IT	PERMANENT GNP	1952	1976	BILL OF 1000 LI	122.020
GNPP:JA	PERMANENT GNP	1953	1976	BILL OF 1000 YEN	162.289
GNPP:NE	PERMANENT GNP	1949	1976	BILL OF GLD	220.339
GNPP:NO	PERMANENT GNP	1951	1976	BILL OF KR	153.211
GNPP:SW	PERMANENT GNP	1949	1976	BILL OF KR	299.803
GNPP:SZ	PERMANENT GNP	1949	1976	BILL OF SF	156.181
GNPP:UK	PERMANENT GNP	1949	1976	BILL OF LBS	101.968
GNPP:US	PERMANENT GNP	1949	1976	BILL OF US\$	1597.968
GNP:AL	G N P CURRENT PRICES	1949	1976	BILL OF AL\$	99B
GNP:AU	G N P CURRENT PRICES	1948	1976	BILL OF AS	99A
GNP:BE	G N P CURRENT PRICES	1953	1976	BILL OF BF	99A
GNP:CA	G N P CURRENT PRICES	1948	1976	BILL OF CA\$	99A
GNP:DE	G N P CURRENT PRICES	1948	1976	BILL OF KR	2626.000
GNP:FI	G N P CURRENT PRICES	1948	1976	BILL OF MA	728.720
GNP:FR	G N P CURRENT PRICES	1950	1976	BILL OF FR	190.030
GNP:GE	G N P CURRENT PRICES	1950	1976	BILL OF DM	232.200
GNP:IT	G N P CURRENT PRICES	1951	1976	BILL OF 1000 LI	111.290
					1820.000
					1123.200
					142.128

DATA DESCRIPTION			SAMPLE	DIMENSION	SOURCE	LAST VAL.
GNP:JA G N P	CURRENT PRICES		1952	1976	BILL OF 1000 YEN	99A 164.470
GNP:NE G N P	CURRENT PRICES		1948	1976	BILL OF GLD	99A 232.850
GNP:NO G N P	CURRENT PRICES		1950	1976	BILL OF KR	99B 170.810
GNP:SW G N P	CURRENT PRICES		1948	1976	BILL OF KR	99B 322.860
GNP:SZ G N P	CURRENT PRICES		1948	1976	BILL OF SF	99A 147.900
GNP:UK G N P	CURRENT PRICES		1948	1976	BILL OF LBS	99B 121.000
GNP:US G N P	CURRENT PRICES		1948	1976	BILL OF US\$	99A 1706.500
GNP':AL G N P	CONSTANT PRICES		1949	1976	BILL OF 1970 AL\$	99B-P 36.910
GNP':AU G N P	CONSTANT PRICES		1954	1976	BILL OF 1970 AS	99A-P 472.210
GNP':BE G N P	CONSTANT PRICES		1953	1976	BILL OF 1970 BF	99A-P 1603.200
GNP':CA G N P	CONSTANT PRICES		1948	1976	BILL OF 1970 CA\$	99A-R 114.860
GNP':DE G N P	CONSTANT PRICES		1950	1976	BILL OF 1970 KR	99B-P 133.300
GNP':FI G N P	CONSTANT PRICES		1950	1976	BILL OF 1970 MA	99B-P 53.370
GNP':FR G N P	CONSTANT PRICES		1949	1976	BILL OF 1970 FR	99A-P 1003.700
GNP':GE G N P	CONSTANT PRICES		1953	1976	BILL OF 1970 DM	99A-R 789.400
GNP':IT G N P	CONSTANT PRICES		1951	1976	TRILL OF 1970 LI	99B-P 68.752
GNP':JA G N P	CONSTANT PRICES		1952	1976	TRILL OF 1970 YE	99A-R 97.716
GNP':NE G N P	CONSTANT PRICES		1960	1976	BILL OF 1970 GLD	99A-P 138.590
GNP':NO G N P	CONSTANT PRICES		1950	1976	BILL OF 1970 KR	99B-P 105.450
GNP':SW G N P	CONSTANT PRICES		1950	1976	BILL OF 1970 KR	99B-P 193.980

STS-SYSTEM

FILE BOPDAT

	DATA DESCRIPTION		SAMPLE	DIMENSION	SOURCE	LAST VAL.
GNP':SZ GNP CONSTANT PRICES		1949	1976	BILL OF 1970 SF	99A-P	98.000
GNP':UK GNP CONSTANT PRICES		1950	1976	BILL OF 1970 LBS	99B-P	56.860
GNP':US GNP CONSTANT PRICES		1948	1976	BILL OF 1970 US\$	99A-R	1164.600
MB:AI MONETARY BASE		1948	1976	BILL OF AL\$	14	6.088
MB:AU MONETARY BASE		1948	1976	BILL OF AS	14	95.850
MB:BE MONETARY BASE		1950	1976	BILL OF BF	14	309.100
MB:CA MONETARY BASE		1948	1976	BILL OF CA\$	14	11.750
MB:DE MONETARY BASE		1948	1976	BILL OF KR	14	12.790
MB:FI MONETARY BASE		1948	1976	BILL OF MA	14	2.889
MB:FR MONETARY BASE		1948	1976	BILL OF FR	14	128.630
MB:GE MONETARY BASE		1951	1976	BILL OF DM	14	118.600
MB:IT MONETARY BASE		1955	1976	BILL OF 1000 LI	14	32.883
MB:JA MONETARY BASE		1953	1976	BILL OF 1000 YEN	14	16.132
MB:NE MONETARY BASE		1948	1976	BILL OF GLD	14	16.400
MB:NO MONETARY BASE		1948	1976	BILL OF KR	14	15.300
MB:SZ MONETARY BASE		1948	1976	BILL OF SF	14	34.720
MB:UK MONETARY BASE		1948	1976	BILL OF LBS	14	9.898
MB:US MONETARY BASE		1948	1976	BILL OF US\$	14	118.900
RD:FI DISCOUNT RATE		1948	1976	%	60	9.250

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
RES\$:AL	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 3.170
RES\$:AU	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 4.410
RES\$:BE	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 5.206
RES\$:CA	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 5.843
RES\$:DE	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$.915
RES\$:FI	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D .498
RES\$:FR	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 9.728
RES\$:GE	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 34.801
RES\$:IT	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 6.654
RES\$:JA	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 16.605
RES\$:NE	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 7.387
RES\$:NO	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 2.229
RES\$:SW	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	2.491
RES\$:SZ	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 12.993
RES\$:UK	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	4.230
RES\$:US	INTERNATIONAL RESERVES	1948	1976	BILL OF US\$	-1--D 18.320
RLD\$:AL	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-1.167
RLD\$:AU	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	1.490
RLD\$:BE	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-.166
RLD\$:CA	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	8.360

STS-SYSTEM

FILE BOPDAT

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
RLD\$:DE	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	4.041
RLD\$:FI	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-.057
RLD\$:FR	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-7.173
RLD\$:GE	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	1.335
RLD\$:IT	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-19.681
RLD\$:JA	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	5.084
RLD\$:NE	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-.317
RLD\$:NO	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-1.400
RLD\$:SW	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	.116
RLD\$:SZ	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	3.889
RLD\$:UK	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	-13.887
RLD\$:US	DOM.-FOR. L.T. INTEREST R. (US\$)	1957	1976	%	5.513
RLD\$:AL	DOM.-FOR. L.T. INTEREST R. (US)	1957	1976	%	1.976
RLD\$:AU	DOM.-FOR. L.T. INTEREST R. (US)	1957	1976	%	.516
RLD\$:BE	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	.816
RLD\$:CA	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	.988
RLD\$:DE	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	5.266
RLD\$:FI	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	1.016
RLD\$:FR	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	1.006
RLD\$:GE	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	-.487

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
RLD:TT	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	5.110
RLD:JA	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	.549
RLD:NE	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	.246
RLD:NO	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	-.984
RLD:SM	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	1.046
RLD:SZ	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	-3.244
RLD:UK	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	6.646
RLD:US	DOM.-FOR. L.T. INTEREST R.	1957	1976	%	-3.192
RL\$:AL	L.T. INTEREST RATE (US\$)	1949	1976	%	3.091
RL\$:AU	L.T. INTEREST RATE (US\$)	1954	1976	%	5.748
RL\$:BE	L.T. INTEREST RATE (US\$)	1949	1976	%	4.092
RL\$:CA	L.T. INTEREST RATE (US\$)	1949	1976	%	12.240
RL\$:DE	L.T. INTEREST RATE (US\$)	1949	1976	%	8.299
RL\$:FI	L.T. INTEREST RATE (US\$)	1949	1976	%	4.201
RL\$:FR	L.T. INTEREST RATE (US\$)	1949	1976	%	-2.347
RL\$:GE	L.T. INTEREST RATE (US\$)	1956	1976	%	5.464
RL\$:IT	L.T. INTEREST RATE (US\$)	1949	1976	%	-14.405
RL\$:JA	L.T. INTEREST RATE (US\$)	1957	1976	%	8.804
RL\$:NE	L.T. INTEREST RATE (US\$)	1949	1976	%	3.941
RL\$:NO	L.T. INTEREST RATE (US\$)	1949	1976	%	2.858

STS-SYSTEM

FILE BOPDAT

		DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
RL\$:SW	L.T.	INTEREST RATE (US\$)	1949	1976	%	4.374
RL\$:SZ	L.T.	INTEREST RATE (US\$)	1949	1976	%	8.147
RL\$:UK	L.T.	INTEREST RATE (US\$)	1949	1976	%	-8.681
RL\$:US	L.T.	INTEREST RATE (US\$)	1949	1976	%	6.780
RL\$:7	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	4.258
RL\$:TCA	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	3.881
RL\$:7FR	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	4.826
RL\$:7GE	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	4.129
RL\$:7IT	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	5.276
RL\$:7JA	FOREIGN L.T.	INTEREST RATE (US\$)	1956	1976	%	3.720
RL\$:7UK	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	5.206
RL\$:7US	FOREIGN L.T.	INTEREST RATE (US\$)	1957	1976	%	1.267
RL:AL	L.T.	INTEREST RATE	1948	1976	%	10.210
RL:AU	L.T.	INTEREST RATE	1954	1976	%	8.750
RL:BE	L.T.	INTEREST RATE	1948	1976	%	9.050
RL:CA	L.T.	INTEREST RATE	1948	1976	%	9.180
RL:DE	L.T.	INTEREST RATE	1948	1976	%	13.500
RL:FR	L.T.	INTEREST RATE	1948	1976	%	9.160
RL:GE	L.T.	INTEREST RATE	1956	1976	%	7.800
RL:IT	L.T.	INTEREST RATE	1948	1976	%	13.080

	DATA DESCRIPTION	SAMPLE	DIMENSION	SOURCE	LAST VAL.
RL:JA	L.T. INTEREST RATE	1957	1976 %	61	8.720
RL:NE	L.T. INTEREST RATE	1948	1976 %	61	8.480
RL:NO	L.T. INTEREST RATE	1948	1976 %	61	7.250
RL:SW	L.T. INTEREST RATE	1948	1976 %	61	9.280
RL:SZ	L.T. INTEREST RATE	1948	1976 %	61	4.990
RL:UK	L.T. INTEREST RATE	1948	1976 %	61	14.430
RL:US	L.T. INTEREST RATE	1948	1976 %	61	6.780
RL:7	FOREIGN L.T. INTEREST RATE (US)	1957	1976 %	8.234	
RL:7CA	FOREIGN L.T. INTEREST RATE	1957	1976 %	8.192	
RL:7FR	FOREIGN L.T. INTEREST RATE	1957	1976 %	8.154	
RL:7GE	FOREIGN L.T. INTEREST RATE	1957	1976 %	8.287	
RL:7IT	FOREIGN L.T. INTEREST RATE	1957	1976 %	7.970	
RL:7JA	FOREIGN L.T. INTEREST RATE	1956	1976 %	8.171	
RL:7UK	FOREIGN L.T. INTEREST RATE	1957	1976 %	7.784	
RL:7US	FOREIGN L.T. INTEREST RATE	1957	1976 %	9.972	
TIME	TIME	1948	1980	1977=1977	1980.000

APPENDIX C: Data

TAB.BR\$-1 NET INTERNATIONAL CAPITAL FLOWS
BILL OF US DOLLARS

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	-3.061	-.061	-.762	.626	-.129	.236	1.275
1959	.324	.054	-.2.096	-.055	-.638	.085	1.558
1960	-4.969	.360	1.134	1.170	1.642	-.184	1.243
1961	-3.048	.699	-.603	.140	-.391	.072	1.263
1962	-4.865	.403	.227	-.160	-.323	-.013	1.044
1963	-4.650	.816	.528	.348	-.471	.266	.535
1964	-7.045	.441	.275	.729	.234	-.422	.669
1965	-6.657	-.799	1.239	.101	.904	-1.275	1.192
1966	-3.548	-1.287	.587	.357	-.137	-2.058	.740
1967	-2.426	-.279	-2.377	.081	.719	-1.102	.477
1968	.566	-.172	-.1.669	-1.734	.989	-2.810	.373
1969	1.044	-1.371	-4.750	1.430	-1.004	-2.702	.908
1970	-4.860	-.784	5.611	.830	-1.464	-.595	.196
1971	.031	4.723	4.163	2.763	3.453	-.573	.599
1972	5.784	-3.618	4.353	1.465	-3.505	-3.001	.733
1973	-5.930	-5.984	5.085	-.795	2.877	-2.159	-.375
1974	-.923	5.966	-10.363	6.265	9.044	8.544	-1.463
1975	-17.914	-.022	-5.223	3.744	2.239	-2.697	-5.400
1976	-1.167	.084	.749	3.168	1.413	4.736	4.891

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB.BE\$-2 NET INTERNATIONAL CAPITAL FLOWS
BILL OF US DOLLARS

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER- LANDS	NORWAY	SWEDEN	SWITZER- LAND
1958	.294	.118	.031	-.072	.001	.090	.211	.050	-.057
1959	.502	.006	-.319	.083	-.020	-.586	.094	-.037	-.175
1960	.535	.128	.091	.015	.043	.072	.132	.138	.167
1961	.628	.169	.256	.106	.081	-.087	.180	.253	.647
1962	.378	.245	-.144	.214	.059	-.153	.177	.057	.498
1963	.657	.141	.321	.239	.069	.128	.230	-.052	.563
1964	.501	.117	.254	.378	.276	.401	.107	.195	.610
1965	.769	.094	-.040	.126	.093	.018	.224	.192	.193
1966	.958	.306	.112	.222	.098	.249	.247	.216	-.020
1967	.754	.273	.043	.224	.137	.252	.392	-.139	-.088
1968	-1.252	.123	-.431	.130	.090	-.221	-.068	.090	.052
1969	.743	-.072	.127	-.412	-.026	.035	-.118	.078	-.392
1970	1.286	.201	-.253	.581	-.113	1.234	.343	.330	.637
1971	2.455	.699	-.220	.661	.564	.714	.865	.135	1.754
1972	2.259	.562	-.746	.192	.162	-.301	.230	.196	.371
1973	-.929	.485	.078	.933	.281	-.581	.615	-.261	.683
1974	1.185	1.013	-.666	.592	1.235	-.1.647	1.471	.140	.320
1975	-.432	1.344	-.248	.434	2.019	-1.510	2.766	2.968	-.1.170
1976	1.312	1.497	-.287	1.944	1.192	-2.094	3.721	1.838	-.936

TAB.BC\$-1 BALANCE OF CURRENT ACCOUNT
BILL OF US DOLLARS

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	.769	.265	1.444	-.221	.923	.563	-1.165
1959	-1.359	.360	1.008	.741	.370	.756	-1.568
1960	2.823	.143	1.108	-.634	-.723	.316	-1.282
1961	2.442	-.982	.735	.953	-.010	.477	-.969
1962	3.332	-.048	-.435	.844	.313	.281	-.776
1963	4.273	-.779	.166	.511	.311	-.715	-.482
1964	6.874	-.480	-.044	.087	-1.067	.627	-.393
1965	5.435	.932	-.1.691	.518	-.215	2.251	-1.045
1966	2.980	1.254	.012	.033	.232	2.169	-1.075
1967	2.374	.190	2.501	.180	-1.123	1.654	-.462
1968	.314	1.048	2.964	-1.059	-1.262	2.688	-.044
1969	.210	2.119	1.931	-1.798	1.109	2.406	-.848
1970	2.383	1.970	.870	.297	1.764	.902	1.077
1971	-1.328	5.797	.884	.530	2.552	2.041	.423
1972	-5.824	6.624	.775	.297	.320	2.266	-.384
1973	7.158	-.136	4.301	-.691	-2.048	2.510	.094
1974	2.603	-.4.693	9.590	-5.942	-8.581	-8.039	1.520
1975	17.739	-.682	3.859	-.003	-3.719	.530	4.900
1976	3.604	3.706	3.018	-6.033	-2.642	-2.856	-4.373

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB.BC\$-2 BALANCE OF CURRENT ACCOUNT
BILL OF US DOLLARS

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER-LANDS	NORWAY	SWEDEN	SWITZER-LAND
1958	.553	.037	.374	.130	.078	.415	-.152	-.035	.222
1959	-.350	.012	.072	.016	.028	.467	-.069	-.001	.175
1960	-.888	-.109	.110	-.059	-.043	.347	-.106	-.088	.094
1961	-.213	-.040	.050	-.109	-.078	.181	-.184	-.046	-.212
1962	-.368	-.011	.084	-.241	-.093	.141	-.176	.010	-.338
1963	-.191	.005	-.104	-.024	-.022	.028	-.180	.008	-.360
1964	-.455	-.028	-.002	-.203	-.176	-.154	-.074	.012	-.411
1965	-.1.132	-.101	.152	-.184	-.188	.049	-.135	-.185	-.070
1966	-.707	-.285	-.096	-.212	-.198	-.214	-.195	-.161	.121
1967	-.958	-.121	.196	-.287	-.142	-.081	-.243	-.047	.239
1968	1.330	-.097	.028	-.216	.064	.065	.093	-.116	.545
1969	-.924	.098	.074	.410	.021	.031	.128	-.197	.524
1970	-.854	.020	.713	-.544	.240	-.522	-.242	-.265	.070
1971	-.832	-.107	.846	-.423	-.341	-.159	-.524	.214	.080
1972	.566	-.187	1.142	-.059	-.117	1.290	-.059	.269	.220
1973	.485	-.329	1.153	-.464	-.389	2.343	-.365	1.215	.280
1974	-2.613	-.457	.911	-.981	-.219	2.057	-.117	-.933	.171
1975	-.581	-.335	.700	-.492	-.2183	1.662	-.458	-.627	2.587
1976	-1.398	-1.526	-.304	-1.906	-1.163	2.372	-3.728	-2.424	3.501

TAB. RES\$-1 INTERNATIONAL RESERVES
BILL OF US DOLLARS

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	22.540	1.032	5.879	1.050	3.068	2.278	2.046
1959	21.505	1.446	4.791	1.736	2.800	3.119	2.037
1960	19.359	1.949	7.033	2.272	3.719	3.251	1.998
1961	18.753	1.666	7.165	3.365	3.318	3.800	2.292
1962	17.220	2.021	6.957	4.049	3.308	4.068	2.560
1963	16.843	2.058	7.651	4.908	3.148	3.619	2.613
1964	16.672	2.019	7.882	5.724	2.315	3.824	2.889
1965	15.450	2.152	7.430	6.343	3.004	4.800	3.037
1966	14.882	2.119	8.029	6.733	3.099	4.911	2.702
1967	14.830	2.030	8.153	6.994	2.695	5.463	2.717
1968	15.710	2.906	9.948	4.201	2.422	5.341	3.046
1969	16.964	3.654	7.129	3.833	2.527	5.045	3.106
1970	14.487	4.840	13.610	4.960	2.827	5.352	4.679
1971	13.190	15.360	18.657	8.253	8.832	6.820	5.701
1972	13.150	18.366	23.785	10.015	5.647	6.085	6.050
1973	14.378	12.246	33.171	8.529	6.476	6.436	5.768
1974	16.058	13.519	32.398	8.852	6.939	6.941	5.825
1975	15.883	12.815	31.034	12.593	5.459	4.774	5.326
1976	18.320	16.605	34.801	9.728	4.230	6.654	5.843

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB. RES\$-2 INTERNATIONAL RESERVES
BILL OF US DOLLARS

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER-LANDS	NORWAY	SWEDEN	SWITZER-LAND
1958	.944	.677	1.553	.230	.259	1.561	.256	.516	2.063
1959	1.096	.695	1.306	.329	.267	1.442	.281	.478	2.063
1960	.743	.714	1.507	.286	.268	1.861	.308	.528	2.324
1961	1.158	.843	1.813	.282	.271	1.955	.303	.735	2.759
1962	1.168	1.077	1.753	.256	.237	1.943	.304	.802	2.919
1963	1.634	1.223	1.970	.470	.283	2.099	.354	.758	3.122
1964	1.680	1.312	2.222	.645	.384	2.346	.387	.965	3.321
1965	1.317	1.305	2.334	.587	.289	2.413	.476	.972	3.444
1966	1.568	1.326	2.350	.597	.189	2.446	.528	1.027	3.545
1967	1.364	1.478	2.589	.534	.184	2.619	.677	.841	3.696
1968	1.442	1.504	2.186	.449	.338	2.463	.702	.815	4.293
1969	1.261	1.530	2.387	.446	.333	2.529	.712	.696	4.425
1970	1.693	1.751	2.847	.483	.459	3.241	.813	.761	5.132
1971	3.316	2.343	3.473	.722	.682	3.796	1.154	1.110	6.966
1972	6.141	2.718	3.869	.855	.727	4.785	1.325	1.575	7.557
1973	5.697	2.874	5.100	1.324	.618	6.547	1.575	2.529	8.520
1974	4.269	3.430	5.345	.935	.634	6.957	1.929	1.736	9.011
1975	3.256	4.439	5.797	.877	.470	7.109	2.237	3.077	10.428
1976	3.170	4.410	5.206	.915	.498	7.387	2.229	2.491	12.993

TAB. EM-1 MARKET EXCHANGE RATE
LOCAL CURRENCY / US DOLLAR

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	1.000	.360	4.193	4.256	.356	.625	.971
1959	1.000	.360	4.179	4.904	.356	.621	.959
1960	1.000	.360	4.171	4.905	.356	.621	.969
1961	1.000	.361	4.019	4.906	.357	.621	1.013
1962	1.000	.361	3.998	4.901	.356	.621	1.069
1963	1.000	.361	3.987	4.901	.357	.622	1.079
1964	1.000	.362	3.975	4.901	.358	.624	1.079
1965	1.000	.361	3.994	4.902	.358	.625	1.078
1966	1.000	.362	3.999	4.914	.358	.624	1.078
1967	1.000	.362	3.987	4.921	.365	.624	1.079
1968	1.000	.361	3.992	4.953	.418	.623	1.078
1969	1.000	.358	3.925	5.200	.418	.627	1.077
1970	1.000	.358	3.646	5.529	.417	.627	1.044
1971	1.000	.349	3.481	5.510	.409	.618	1.010
1972	1.000	.308	3.189	5.044	.400	.583	.991
1973	1.000	.272	2.672	4.454	.403	.583	1.000
1974	1.000	.292	2.592	4.810	.428	.650	.978
1975	1.000	.297	2.461	4.236	.452	.653	1.017
1976	1.000	.297	2.518	4.780	.557	.832	.986

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB. EM-2 MARKET EXCHANGE RATE
LOCAL CURRENCY / US DOLLAR

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER-LANDS	NORWAY	SWEDEN	SWITZER-LAND
1958	.893	25.950	49.890	6.905	3.200	3.785	7.139	5.174	4.287
1959	.894	25.974	49.971	6.893	3.203	3.775	7.129	5.175	4.321
1960	.894	26.001	49.866	6.894	3.207	3.772	7.134	5.168	4.319
1961	.896	25.986	49.869	6.908	3.215	3.632	7.143	5.167	4.319
1962	.894	25.850	49.769	6.901	3.221	3.603	7.138	5.156	4.324
1963	.896	25.847	49.871	6.904	3.223	3.601	7.150	5.189	4.322
1964	.899	25.841	49.753	6.916	3.220	3.607	7.158	5.151	4.319
1965	.898	25.837	49.643	6.915	3.223	3.600	7.151	5.158	4.328
1966	.899	25.849	49.835	6.908	3.224	3.619	7.151	5.166	4.326
1967	.899	25.848	49.689	6.987	3.439	3.602	7.150	5.162	4.328
1968	.899	25.857	49.936	7.484	4.190	3.620	7.143	5.168	4.316
1969	.900	25.871	50.136	7.519	4.202	3.624	7.144	5.170	4.313
1970	.898	25.867	49.656	7.500	4.180	3.617	7.147	5.186	4.311
1971	.880	24.914	48.593	7.407	4.174	3.495	7.044	5.108	4.115
1972	.839	23.115	44.015	6.977	4.146	3.209	6.588	4.762	3.819
1973	.706	19.580	38.976	6.049	3.821	2.796	5.766	4.367	3.166
1974	.697	18.692	38.958	6.095	3.774	2.689	5.540	4.439	2.979
1975	.764	17.417	36.781	5.746	3.679	2.529	5.227	4.152	2.581
1976	.818	17.940	38.604	6.045	3.864	2.644	5.457	4.356	2.500

TAB.RL-1 LONG TERM INTEREST RATE
% P.A.

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	3.4%	9.7%	6.8%	5.7%	5.5%	6.8%	4.1%
1959	4.1%	8.4%	5.8%	5.3%	5.2%	5.6%	5.1%
1960	4.0%	8.4%	6.4%	5.1%	5.8%	5.0%	5.2%
1961	3.9%	11.4%	5.9%	5.1%	6.3%	5.2%	5.0%
1962	3.9%	10.3%	5.9%	5.0%	5.9%	5.8%	5.1%
1963	4.0%	7.5%	6.1%	5.0%	5.4%	6.1%	5.1%
1964	4.1%	10.3%	6.2%	5.1%	6.0%	7.4%	5.2%
1965	4.2%	7.0%	7.1%	5.3%	6.6%	6.9%	5.2%
1966	4.7%	6.9%	8.1%	5.4%	6.9%	6.5%	5.7%
1967	4.8%	6.9%	7.0%	5.7%	6.8%	6.6%	5.9%
1968	5.3%	7.0%	6.5%	5.9%	7.5%	6.7%	6.7%
1969	6.1%	7.1%	6.8%	7.6%	9.0%	6.8%	7.6%
1970	6.6%	7.2%	8.3%	8.1%	9.2%	9.0%	7.9%
1971	5.7%	7.3%	8.0%	7.7%	8.9%	8.3%	6.9%
1972	5.6%	6.7%	7.9%	7.3%	8.9%	7.5%	7.2%
1973	6.3%	7.3%	9.3%	8.2%	10.7%	7.4%	7.6%
1974	7.0%	9.3%	10.4%	10.5%	14.8%	9.9%	8.9%
1975	7.0%	9.2%	8.5%	9.5%	14.4%	11.5%	9.0%
1976	6.8%	8.7%	7.8%	9.2%	14.4%	13.1%	9.2%

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB.RL-2 LONG TERM INTEREST RATE
% P.A.

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER- LANDS DISCOUNT RATE	NORWAY	SWEDEN	SWITZER- LAND
1958	5.0%	7.2%	5.5%	5.2%	7.2%	4.3%	4.8%	4.3%	3.2%
1959	4.9%	6.7%	5.0%	5.3%	6.7%	4.1%	4.6%	4.3%	3.1%
1960	5.0%	6.9%	5.5%	5.8%	6.7%	4.2%	4.6%	5.2%	3.1%
1961	5.3%	7.3%	5.9%	6.0%	6.7%	3.9%	4.6%	5.3%	3.0%
1962	4.9%	7.1%	5.2%	6.3%	7.0%	4.2%	4.9%	5.0%	3.1%
1963	4.6%	6.8%	5.0%	6.4%	7.0%	4.2%	5.0%	4.9%	3.2%
1964	4.7%	6.4%	6.4%	6.2%	7.0%	4.9%	4.9%	5.6%	4.0%
1965	5.2%	6.5%	6.4%	7.3%	7.0%	5.5%	5.0%	6.2%	3.9%
1966	5.2%	6.9%	6.6%	7.9%	7.0%	6.6%	5.0%	6.6%	4.2%
1967	5.2%	7.2%	6.7%	8.2%	7.0%	6.2%	5.0%	6.1%	4.6%
1968	5.2%	7.7%	6.5%	8.4%	7.0%	6.5%	4.9%	6.3%	4.4%
1969	5.8%	7.5%	7.2%	9.3%	7.0%	7.5%	5.1%	7.0%	4.9%
1970	6.7%	7.8%	7.8%	10.6%	7.0%	8.2%	6.3%	7.4%	5.8%
1971	6.9%	7.7%	7.3%	10.7%	8.5%	7.3%	6.4%	7.2%	5.3%
1972	6.0%	7.4%	7.0%	10.4%	7.7%	6.9%	6.3%	7.3%	5.0%
1973	7.2%	8.2%	7.4%	11.1%	9.2%	7.8%	6.2%	7.4%	5.6%
1974	9.1%	9.7%	8.7%	14.5%	9.2%	9.7%	7.1%	7.8%	7.1%
1975	9.7%	9.6%	8.5%	13.1%	9.2%	8.3%	7.3%	8.8%	6.4%
1976	10.2%	8.7%	9.0%	13.5%	9.2%	8.5%	7.2%	9.3%	5.0%

TAB.FAM-1 FOREIGN ASSETS OF MONETARY AUTHORITIES
BILL OF LOCAL CURRENCY

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	22.600	.448	27.200	1.880	1.096	1.527	1.970
1959	21.600	.656	25.300	7.400	1.000	2.094	1.940
1960	19.400	.656	33.600	10.720	1.328	2.205	1.990
1961	18.700	.535	32.200	15.620	1.185	2.606	2.390
1962	17.300	.662	31.300	20.220	1.181	2.900	2.760
1963	16.900	.676	33.800	24.400	1.124	2.306	2.820
1964	16.600	.727	34.600	28.320	.827	2.557	3.100
1965	15.400	.774	33.200	31.450	1.073	3.016	3.260
1966	14.500	.762	35.000	33.340	1.107	3.141	2.930
1967	14.200	.731	35.400	34.620	1.123	3.186	2.940
1968	14.800	1.046	42.500	20.680	1.009	3.398	3.270
1969	17.600	1.315	28.400	20.500	1.081	3.154	3.330
1970	14.500	1.742	52.300	27.650	1.366	3.405	4.730
1971	12.000	4.767	62.200	43.710	3.815	3.952	5.710
1972	13.200	5.656	77.500	51.050	2.655	3.464	6.020
1973	14.500	3.771	92.500	44.090	2.635	3.599	5.740
1974	15.900	4.163	83.400	42.640	2.514	4.241	5.770
1975	16.200	3.947	86.400	99.850	1.954	3.086	5.410
1976	18.600	5.114	88.500	92.690	1.426	11.599	5.900

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB.FAM-2 FOREIGN ASSETS OF MONETARY AUTHORITIES
BILL OF LOCAL CURRENCY

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER-LANDS	NORWAY	SWEDEN	SWITZER-LAND
1958	889	17.590	79.200	1.590	.829	5.920	1.710	2.580	8.920
1959	1.007	18.060	72.900	2.290	1.056	5.530	1.930	2.370	8.980
1960	799	18.560	81.300	1.990	1.051	7.090	2.120	2.630	10.140
1961	1.068	21.910	93.600	1.970	1.100	7.070	2.090	3.640	11.950
1962	1.149	28.010	91.900	1.890	1.008	7.020	2.090	4.140	12.630
1963	1.504	31.830	102.900	3.280	1.110	7.590	2.450	3.920	13.500
1964	1.648	34.100	115.400	4.480	1.309	8.500	2.680	4.990	14.350
1965	1.288	33.930	123.500	4.070	1.008	8.750	3.320	5.030	14.890
1966	1.336	34.490	125.200	4.140	.674	8.890	3.720	5.310	15.320
1967	1.224	38.430	137.600	4.020	.852	9.500	4.790	4.350	15.980
1968	1.279	39.100	123.800	3.370	1.560	8.910	4.970	4.210	18.530
1969	1.165	39.780	129.200	3.350	1.525	9.140	5.080	3.600	19.100
1970	1.542	45.520	144.400	3.630	2.031	11.700	5.810	3.940	22.140
1971	2.785	53.900	166.900	5.080	2.938	12.460	7.690	5.340	26.500
1972	4.794	62.790	194.900	5.870	3.177	15.610	8.820	7.580	28.510
1973	3.953	57.680	222.600	8.320	2.823	18.850	8.990	11.530	29.030
1974	3.260	61.220	227.300	5.330	2.532	18.510	9.980	7.750	28.870
1975	2.907	84.070	253.300	5.440	2.586	20.040	12.490	13.010	32.000
1976	2.772	77.480	226.900	5.370	2.813	19.660	11.590	10.860	37.550

TAB.DAM-1 DOMESTIC ASSETS OF MONETARY AUTHORITIES
BILL OF LOCAL CURRENCY

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	28.100	.486	.200	35.100	1.458	1.578	.810
1959	29.200	.462	4.600	30.120	1.661	1.095	.840
1960	30.600	.675	1.500	31.560	1.436	1.090	.880
1961	32.600	1.183	4.100	32.250	1.679	1.164	.660
1962	35.500	1.205	6.900	33.860	1.729	1.524	.410
1963	37.800	1.577	7.200	36.410	1.889	2.892	.510
1964	40.900	1.820	11.200	36.500	2.420	3.063	.410
1965	45.100	2.011	15.700	37.960	2.520	3.270	.590
1966	50.000	2.392	17.000	39.010	2.698	3.752	1.220
1967	54.100	3.005	15.100	43.130	2.859	4.557	1.450
1968	58.000	3.395	11.500	62.660	3.128	4.965	1.480
1969	58.400	3.998	27.400	62.210	3.140	6.306	1.670
1970	66.700	4.452	15.500	58.740	3.344	7.232	.550
1971	76.800	2.328	15.800	51.770	.654	8.497	.370
1972	79.000	3.497	21.000	74.620	2.762	10.229	1.010
1973	85.100	8.521	13.300	90.950	4.490	13.027	2.420
1974	89.700	10.114	21.200	110.230	4.900	14.579	3.540
1975	96.400	10.908	21.200	19.860	6.303	24.071	5.340
1976	100.300	11.018	30.100	35.940	8.472	21.284	5.850

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB.DAM-2 DOMESTIC ASSETS OF MONETARY AUTHORITIES
BILL OF LOCAL CURRENCY

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER-LANDS	NORWAY	SWEDEN	SWITZER-LAND
1958	.827	3.800	41.600	2.060	-.099	-.560	2.570	3.960	.190
1959	.838	4.560	48.100	1.500	-.278	-.100	2.600	4.370	.160
1960	1.072	4.600	44.500	1.700	-.257	-.1.200	2.550	4.430	-.510
1961	.696	4.800	40.100	2.210	-.197	-1.000	2.930	3.760	-.770
1962	.784	2.280	48.700	2.770	-.140	-.480	3.110	3.770	-.270
1963	.481	1.560	50.400	1.660	-.121	-.810	3.150	4.560	-.150
1964	.618	3.970	47.400	.760	-.188	-.970	3.120	3.980	-.070
1965	.841	5.150	48.600	1.570	-.120	-.490	2.960	4.360	-.120
1966	.757	7.460	51.900	1.980	.586	-.060	3.020	4.650	.070
1967	1.035	7.140	42.600	2.440	.524	-.400	2.190	6.290	.470
1968	1.193	7.240	61.000	4.620	-.089	.370	2.480	7.140	.280
1969	1.545	8.610	55.200	5.040	-.099	.820	2.900	8.550	1.220
1970	1.154	5.980	45.400	3.940	-.552	-.1.190	2.410	8.610	.750
1971	.409	3.780	36.500	2.640	-.1.297	-.1.430	1.480	8.700	.630
1972	-.965	3.420	37.100	2.240	-.1.278	-3.580	.780	7.860	.770
1973	.816	10.150	38.300	-.020	-.715	-.6.240	1.240	5.390	1.730
1974	.901	15.090	44.700	3.480	-.061	-.4.910	1.660	15.070	2.810
1975	2.508	5.250	36.700	6.800	.276	-.4.600	1.170	9.670	.300
1976	3.316	18.370	82.200	7.420	.076	-.3.260	3.710	14.240	-2.830

TAB. GNP-1 G N P AT CURRENT MARKET PRICES
BILL OF LOCAL CURRENCY

	UNITED STATES	JAPAN	GERMANY	FRANCE	UNITED KINGDOM	ITALY	CANADA
1958	448.900	11.521	231.500	244.700	22.840	18.862	34.780
1959	486.500	12.926	250.600	272.600	24.070	20.029	36.850
1960	506.000	15.487	303.000	301.600	25.530	21.751	38.360
1961	523.300	19.124	331.400	328.400	27.270	24.198	39.650
1962	563.800	21.202	360.500	367.200	28.570	27.195	42.930
1963	594.700	24.475	382.100	412.000	30.390	31.140	45.380
1964	635.700	28.916	419.600	456.700	33.180	34.027	50.280
1965	688.100	31.953	458.200	489.800	35.610	36.530	55.360
1966	753.000	36.822	487.400	532.500	37.960	39.521	61.830
1967	796.300	43.570	493.700	574.800	40.110	43.517	66.410
1968	868.500	51.600	535.200	630.000	43.360	46.953	72.590
1969	935.500	59.669	597.700	734.000	46.420	51.691	79.820
1970	982.400	70.709	679.000	783.600	51.020	57.937	85.690
1971	1063.400	79.258	756.000	873.100	57.050	63.056	94.450
1972	1171.100	90.621	827.200	981.300	63.170	69.080	105.230
1973	1306.600	111.034	920.100	1115.100	72.110	82.503	123.560
1974	1412.900	132.234	986.900	1274.300	81.980	100.911	147.170
1975	1528.800	145.446	1030.300	1442.400	103.290	114.215	165.440
1976	1706.500	164.470	1123.200	1820.000	121.000	142.128	190.030

S T S - S Y S T E M

STANFORD UNIVERSITY

TAB.GNP-2 G N P AT CURRENT MARKET PRICES
BILL OF LOCAL CURRENCY

	AUSTRAL.	AUSTRIA	BELGIUM	DENMARK	FINLAND	NETHER-LANDS	NORWAY	SWEDEN	SWITZER-LAND
1958	11.590	137.420	521.000	34.100	12.950	35.930	28.920	62.270	31.500
1959	12.450	146.320	537.000	37.810	14.080	38.440	30.700	66.240	33.800
1960	13.720	163.250	572.000	40.790	15.820	42.730	32.680	72.160	37.100
1961	14.590	180.760	606.000	45.260	17.630	44.820	35.630	78.520	41.500
1962	14.930	192.350	648.000	50.990	18.860	48.000	38.440	85.200	46.000
1963	16.090	207.320	696.000	54.280	20.540	52.260	41.530	92.110	50.400
1964	17.850	227.140	778.000	62.050	23.550	61.470	45.930	102.680	55.500
1965	19.600	247.430	849.000	69.700	25.830	68.560	50.910	113.320	60.000
1966	20.540	267.570	912.000	76.500	27.780	74.430	55.460	123.290	64.600
1967	22.570	283.160	977.000	83.820	30.110	81.850	59.910	133.370	68.800
1968	24.070	302.760	1046.000	92.400	34.150	90.400	63.800	141.680	77.200
1969	27.070	331.730	1160.000	105.600	39.010	102.360	69.450	153.370	84.000
1970	29.950	371.240	1292.000	116.800	43.590	114.980	79.690	170.880	93.900
1971	32.920	412.700	1415.000	128.450	47.660	129.850	89.070	183.790	106.500
1972	36.720	469.400	1578.000	145.480	54.910	147.230	98.270	199.430	120.500
1973	41.880	533.270	1792.000	165.160	66.750	169.210	111.410	220.180	134.500
1974	50.700	613.450	2105.000	184.180	84.170	188.130	128.930	249.440	146.500
1975	59.990	654.420	2320.000	203.700	98.570	204.270	147.930	286.370	144.300
1976	70.240	728.720	2626.000	232.200	111.290	232.850	170.810	322.860	147.900